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THE PEDIATRICIAN

HIS OBLIGATION TO THE STATE IN TIME OF WAR

CHAIRMAN'S ADDRESS

JULIUS H. HESS, M.D.

CHICAGO

When I first selected the subject for my talk, it was with the belief that it would be opportune to emphasize the place of the pediatrician in the nation and his local community, both in time of peace and in time of war. The rapidly changing events, however, lead me to place a limitation on the scope of my presentation. In the peace time that obtains in the United States at the moment, the peace that may only be the prelude to war, our obligation is clearly one of putting ourselves at the service of our nation. The least we can do for the children to whom we have tried to give the benefits of our knowledge in the past is to preserve for them the type of government we hold to be best, one in which freedom, liberty and justice are available to all.

We are living in a period in which every day brings with it a new interpretation of our responsibilities to the nation. Never has there been a conflict between nations in which the principles of humanitarianism have been so completely subordinated to the lust for conquest and power. Neither the babes in arms, the mother who bore them nor the bedridden hospital patients are spared in today's calculated plans for destruction. Barbarian tribes sometimes carried their women and children in the wake of the march toward battle, but only today has it come to pass that we slaughter the innocent by bringing fire and destruction into their homes in order to create paralyzing fear and bring morale to the zero point.

In a situation such as this, every man and woman has a place of responsibility to fill. Not every one will have the satisfaction of wearing a uniform or marching to martial music; nevertheless his and her services can be of the greatest importance in keeping bright and clear the road our country is to follow. The types of service that we can render and which will leave their impress on the history of our time are too many and too varied to bear enumeration. The pediatrician has broad training, knowledge and skill to offer his country, especially in the fields of general medicine, contagious diseases and nutrition. I know that he stands willing to give to his people the fruits of that wisdom. His contribution will be of high quality, whether it be in the field, the hospital, his own community or such place to which he may be assigned at home or abroad.

We have in this war seen the success attributable to a long period of careful and intensive planning in the matter of the organization of all possible resources. As physicians, our special province lies in planning for the health and morale of the army and our civilian population. Such plans must of course be coordinated by the various branches of our federal government so that they take their place in the general scheme. The American Medical Association has already proved of great assistance in attempting to classify all physicians in the United States in order that they may be grouped in that service for which their training, experience and aptitude best fit them. Most valuable aid is being rendered by the state and county medical societies in their services to the draft boards and other state and local activities related to military service. The American Academy of Pediatrics through its national, regional and state activities has much to offer to public health in the military sense as well as to those in civilian life.

The physician will be called on to render services on the battlefield, in camps and at home. The requirements of the Army and Navy have to a great extent changed since the last World War, in that there has been a gradual expansion of the Medical Reserve Corps. Furthermore, many of our younger physicians have received medical military instruction as a part of their undergraduate and medical education.

Let us now, with some justification, attempt to analyze the part that each one of us can play to advantage in this struggle for a natural existence in a democratic country. The medical student has now been granted an opportunity to finish his medical education and to enhance his experience by one full year of internship. The intern with his placement in the deferred class, implying special consideration for his future service, should, and to a great degree must, develop a sense of obligation which carries with it a necessity for sacrifice of time and energy. Even during his hospital months, local induction boards and boards of appeal offer opportunity for voluntary service or, if need be, compulsory service.

For the young man ready to begin practice, there should be no choice but that of filling some station of active duty, be it in the field or sharing in the conserving of the health and morale of the people at home. It is not improbable that he will be drafted for such services, should the period of the war be a prolonged one. For the young man who is established in practice and beyond the conscription age, the decision must lie within himself. There may be a real sacrifice involved for him and his family which will lead to a complete change in the pattern of all their lives. His decision can be only a voluntary one, but in many instances it will be his emotions that will prompt his final action.

To the older group among us who are still physically and mentally capable there comes a real challenge. In

Read before the Section on Pediatrics at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 5, 1941.

their maturity and from the depth of their experience they have much to offer in whatever position they may seek to serve. It must naturally be expected that many who may desire to join up with the active services must remain at home to carry on educational or governmental services in the community.

The House of Delegates of the Illinois State Medical Society at its annual meeting, May 22, 1941, passed a resolution instructing its delegates to the American Medical Association that women physicians be allowed to share all the privileges of men in services to the Army and Navy. This action underlines the conviction of us all that it will be every citizen's duty and privilege to serve his nation to the full extent of his ability in the coming crisis.

THE PEDIATRICIAN IN THE ARMY

As a senior medical student in 1898 I experienced the enthusiastic response to the call of the Army at the beginning of the Spanish American War. None of my classmates ever reached the field of battle, but several died in Army hospital camps.

The following editorial, appearing in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION on March 25, 1899, should make us wonder whether we have profited from the past:

> The mistakes and serious blunders that were made can be almost invariably traced back to the unprepared condition in which we entered into hostilities. The public that enthusiastically demanded war with Spain was one that knew nothing of what war really is; the volunteers who offered their services so freely had no idea of the realities that they were to encounter; the army bureaus, inadequate as they were, were largely manned by men who had grown up in the traditions of thirty-odd years of peaceful red tapeism, and their reinforcement to meet the emergency was necessarily with inexperienced men.

I am certain that there can be only agreement among us as to the profound realities presented by our present situation as a potential belligerent in this second World War. The problem to be solved by and for us is how and where we are to participate in the military or public activities brought about through war. Resolutions passed by the regional components of the American Academy of Pediatrics point to some of the considerations which should with profit be emphasized in the assignment of pediatricians to duty:

> To the Surgeon Generals of the United States Navy, United States Army and Committee on Defense:
>
> WHEREAS, Pediatricians are eager to serve in the National Defense Program to the best interest of the federal government; and
>
> WHEREAS, The pediatrician occupies an unusually favorable position, by virtue of his training and experience, with regard to the management of nutritional problems and the problems concerned with sanitation and contagious disease control; therefore be it
>
> *Resolved*, That the Surgeon Generals of the United States Army and Navy be respectfully urged to outline the objectives to be fulfilled in the Army and Navy by the pediatricians of the nation individually and collectively; and that furthermore
>
> In the formulation of such a policy for the service, both public and private, of pediatricians to the nation, that their exceptional training in nutritional problems, the care of the contagious diseases and the supervision of child welfare in the nation be given special consideration.

It was my experience at the time of my first assignment in the first World War, to be stationed at Fort Riley, Kansas. Our recruits came largely from the four states of Louisiana, Mississippi, Arkansas and Oklahoma, and the greatest number of them had lived in villages and sparsely settled rural districts. It was not surprising to find that a very high percentage of these young men had not been exposed to or at least had not experienced most of the acute contagious diseases. Therefore, when exposed to measles, mumps, scarlet fever or diphtheria in the crowded camps they contracted these diseases in their most severe form. Secondary complications developed, with an exceptionally high mortality, due mainly to hemolytic streptococcus infection. When I arrived in camp there were 122 cases of meningococcic meningitis in the wards, and there was a shortage of specific serum. The mortality rate was 25 per cent. At one time we had 17 cases of smallpox among our poorly protected Southern soldiers in our isolation unit.

Dr. Philip M. Stimson, in the May 1941 issue of the *Journal of Pediatrics* reported the following estimated number of cases among the acute contagious diseases in the U. S. Army of 4,000,000 men during the first World War:

Measles, 98,000 cases with 2,000 deaths.
Diphtheria, 10,000 cases with 177 deaths.
Mumps, 230,000 cases.

These figures do not tell us how many soldiers were incapacitated for future active military service.

With our newer therapy, including the various drugs of the sulfonamide group and the type specific serums, it is our hope that we shall never again suffer a similar pandemic of influenza, and that all types of pneumonia may be more readily brought under control and complications decreased.

In any event, even the few figures I have given should be sufficient to support the contention that the Army and Navy have a wide field of practice for the pediatrician.

THE PEDIATRICIAN IN THE CARE OF THE CIVILIAN POPULATION

In this war, political and economic hostilities have become an integral part of the invader's plans. The eventual effect that this will have on the noncombatants not only during the war but also in the peace that will follow is difficult to evaluate in full measure. The decreasing birth rate, increasing death rate, lowering of the standard of living of the invaded nations, appalling destruction of adult life, and the incapacitating of men and women are but a few of the immediate results of general total warfare. Those of us who may not participate in active service in the Army and Navy can therefore contribute much to our nation in the prevention of morbidity and mortality among noncombatants during and after the war.

In the present war, epidemics experienced in the different countries have largely been influenced by such factors as the disease prevalent in the particular area and the constitutional and nutritional condition of its people. Disease is becoming widespread in those European countries under the domination of the victorious army, which provides first and foremost for its own soldiers and remains indifferent to the food needs of the inhabitants. In many instances, especially in those disrupted and demoralized communities where a low food supply has been combined with a complete lack of provision for sanitation, pestilence is not slow in appearing.

We can learn much from the experience of England in its effort to increase the chances for safety of its children. On the face of it, the answer to their problem at first appeared to be a hurried evacuation of children from cities and their dispersion among the rural sections of the population. However, the results obtained during the first six months after evacuation of children, some accompanied by their mothers, into the rural areas showed that most of the mothers and at least one half of the children had returned to their homes. This reflux added to the difficulties of readjustment for the health authorities of both the evacuating and the reception areas. Many children adjusted themselves to their new surroundings quite readily but others were unexpectedly sensitive. As an English child psychologist has pointed out: "Evacuees are human beings. 'Being billeted' involves some delicate adjustments of human relationships."

The dangers inherent in close contacts, with the ever prevalent tendency to development of epidemics, is even greater among infants and children than in an army. In order to be successful, evacuation must have the cooperation and early consultation of the authorities of both evacuating and reception districts. This applies to joint sessions of pediatricians, psychiatrists, administrators, child psychologists, nurses, in fact all who can contribute from their experience to the program. It is here that the state and county medical societies with their compact organizations can be of great assistance. The pediatrician, because of his over-all perspective of the child, should expect to take a leading part.

Only by advance planning and outlining of the place to be filled by each pediatrician in army, navy or civilian activities will the best interests of the nation be served. Even when the patriotic physician knows that his talents can best be utilized at home, it is difficult for him to stand by waiting for such a position to be found for him while his colleagues appear in uniform. All uncertainty and doubt could be avoided if his services were planned for in advance of an emergency and he was assigned definite responsibilities. At the same time, such a provision would assure a more efficient and integrated system of civilian care.

Should it come to pass that we of the United States are spared the sacrifices of battle, we should be thankful that we have had these lessons in integrating our experience and talents. If it becomes our lot to enter into active participation in the present war, whether our country is to be found among the victors or among those who suffer defeat, ultimately disease will gain the final victory. Illness and pestilence will thrive long after the last gun has spoken, and we must be prepared to face and minimize the serious consequences.

We all realize that we are leaving a greater burden to be carried by the future generation than the share which we ourselves are called on to assume. Let us at least remember our responsibility to fortify the next generation so that they will have the physical and mental courage to take up where we leave off. And even though we are not leaving the best of worlds for our children, let us at least have the solace of knowing that we are walking into a war so that the world in which they must live will be one that will still have some remnants of tolerance, democracy and humanitarianism.

104 South Michigan Avenue.

CONCEALED RUPTURED INTERVERTEBRAL DISKS

A PLEA FOR THE ELIMINATION OF CONTRAST MEDIUMS IN DIAGNOSIS

WALTER E. DANDY, M.D.
BALTIMORE

In 1929 I [1] reported the first 2 cases of ruptured intervertebral disk in which operation was performed during the preceding year. It was recognized that they were of traumatic origin; that the trauma was relatively slight and with minor strains the symptoms flared up anew after a quiescent period. Both of these disks were localized by injections of iodized oil which disclosed blocks in the lumbar canal. It was suggested at the time that the lesion might explain many cases of sciatica. Both of these patients have since remained well. In a little more than a decade this has become the most frequent lesion encountered by neurosurgeons.[2]

Mixter [3] went a step further and localized the lesion before the protruding disk had produced a total block in the spinal canal. This diagnosis was made by a localized filling defect in the solid mass of iodized oil (5 cc.) injected into the spinal canal. Until recently iodized oil has continued to be the routine method of detecting these little localized protrusions. However, the fact that iodized oil is a permanent deposit in the subarachnoid space (unless removed subsequently) and passes freely into all the fluid containing spaces in the cranial chamber has remained a matter of serious concern, even though there is no absolute proof that it does actual harm. The roentgenograms are enough to deter one from its use if it could possibly be avoided; and its presence is a good excuse for medicolegal action, particularly if no disk was found.

In 1937 Reichert [4] first substituted air for iodized oil as a contrast medium and in 1939 reported [5] 35 cases with excellent diagnostic results. He, however, still retained iodized oil as a check in the doubtful cases. This method was quickly adopted by many others and is used either exclusively (Love) or with iodized oil subsequently when in doubt. Air shadows are by no means so striking as iodized oil shadows, but with excellent plates and the highest skill in their interpretation they can be almost as satisfactory.

The next great diagnostic advance was made by Semmes.[6] He reported 16 cases that were diagnosed, without any contrast medium whatever, solely by history and neurologic examinations. And among these were 4 cases in which iodized oil had been injected by others and failed to disclose a disk. Spurling [7] stated that many of the disks could be diagnosed on clinical

1. Dandy, W. E.: Loose Cartilage from Intervertebral Disk Simulating Tumor of the Spinal Cord, Arch. Surg. **19**: 660 (Oct.) 1929.

2. The remarkable anticipation of this lesion by J. E. Goldthwait (The Lumbosacral Articulation, Boston M. & S. J. **164**: 365 [March 16] 1911) has never received the credit it deserves.

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5. Reichert, F. L.: The Injection of Air for Localization of Lesions in the Spinal Canal—Pneumomyelography, West. J. Surg. **47**: 297 (June) 1939.

6. Semmes, R. E.: Diagnosis of Ruptured Intervertebral Disk Without Contrast Myelography and Comment upon Recent Experiences with Modified Hemilaminectomy for Their Removal, Yale J. Biol. & Med. **11**: 433 (May) 1939.

7. Spurling, R. G., in discussion on Love.[10]

studies alone. Love and Walsh [8] observed that without contrast mediums the diagnostic error was less than 0.5 per cent.

One of the most important disclosures in this diagnostic field has been the very high incidence of protruding disks at the fourth and fifth lumbar interspaces. Love in 1938 found 87 per cent in these two disks. In 1940 two papers appeared in the same issue of the *Archives of Surgery* by Love and Walsh [8] and by Spurling and Grantham,[9] in both of which 96 per cent of all the lesions were found at the fourth and fifth lumbar disks and they were fairly evenly divided between these two locations. With such a selective localization of this lesion, contrast mediums are hardly necessary in the diagnosis.

Three important surgical advances have contributed greatly to the patient's welfare: (1) The substitution of a unilateral approach for the previously used bilateral removal of one or more laminas (Semmes,[6] April 6, 1939 and Love [10]); (2) both Semmes and Love still further reduced the amount of bone removed by cutting away only the edges of the laminas contiguous to the disk and thus maintaining the integrity of the laminal arch; and finally (3) Love [8] removed many of the disks without sacrificing any bone. Ample room is usually obtained between the laminas after removing the ligamentum flavum.

My purposes in this communication are twofold: (1) to enter a plea for the elimination of all forms of contrast mediums for localization of vertebral disks and (2) to present observations on a "concealed" type of ruptured intervertebral disk that cannot be disclosed by intraspinal injections.

The reasons for avoiding spinal injections of any kind are that (1) they are unnecessary, (2) they may be misleading, (3) they add to the patient's discomfort and finally, (4) the permanent deposit of iodized oil in the brain and spinal cord is avoided. In other words the diagnosis of a ruptured disk and its location can be much better made solely by the history and examination, and by so doing one relieves the patient of discomfort and possible after-effects. Not even a lumbar puncture is necessary.

Since it has now been demonstrated that over 96 per cent of all lumbar vertebral disks are at the fourth and fifth lumbar spaces and since the unilateral approach is adequate to find the lesion whether it is at the fourth or the fifth disk, it only remains to make the diagnosis of a lumbar vertebral disk in order to disclose and remove it.

During the past eight months I have removed 37 vertebral disks; 29 of the patients had no spinal injection of any kind and a disk was found in each. Two had had iodized oil injections elsewhere (1 was operated on) with negative findings. In 6 of the 37 cases I had injected iodized oil (1.5 cc.), in 3 of which there were no positive findings and in 3 the protrusion showed distinctly. It is now clear that in none of these 8 cases was the iodized oil needed, and in 5 of them the operation would not have been made had the iodized oil been depended on for the diagnosis. At the present time the iodized oil test would not be made in any of these cases.

How can the diagnosis of a ruptured vertebral disk at the fourth and fifth lumbar interspaces be made with assurance? The diagnosis is made on low midline lumbar backache plus pain down the back of one or both legs, the pain is intensified by coughing and sneezing, and the pain must be recurring and not continuous. When this simple story is obtained there is no other lesion that need be considered. There may or may not be diminution of the achilles reflex or sensory or motor loss in the distribution of the fourth or fifth lumbar or first sacral nerve.

The history of trauma, which is always the cause, may be difficult to elicit and need not be obtained. The injury is usually a minor one, such as a heavy lift, a wrench or a sudden movement. I can't recall having seen a protruding disk after a severe back injury. The history of recurring pain is essential to the diagnosis and in the differential diagnosis from psychogenic backaches, which are always present.

There isn't any positive way by which the differentiation between ruptures of the fourth and fifth disks can be made with certainty before operation. A diminished achilles reflex suggests that the lesion is at the fourth, though with this finding it may still be at the fifth disk. (Spurling thinks it is evidence of a fifth disk rather than the fourth.) But the operative exposure permits exploration of both disks after removal of both ligamenta flava if necessary. Semmes [11] operates under local anesthesia and says that pressure with the forceps on the ligamentum flavum over the disk will induce the original pain, whereas pressure on the other will not. This may well be a decided advance.

In none of the 29 cases in which operation was performed without contrast mediums in the spinal canal has even a lumbar puncture been done. The presence of increased globulin in the cerebrospinal fluid has been regarded as an important diagnostic sign of ruptured disk, but I regard the clinical story so indicative of this lesion that I prefer not to subject the patient to the discomfort of a lumbar puncture. Roentgenograms of the spine are rarely helpful in diagnosis. Only once have I seen roentgenograms of value, and in that case a corner of the bone was chipped off and dislocated posteriorly.

Can the diagnosis of a ruptured disk always be made unequivocally? The answer is no, but the percentage of error should be very small. During the same period of seven months I have performed four negative explorations. All of these were pure explorations, in three of which iodized oil had been injected and gave negative results. In 2 of these cases I felt certain that there was no disk because the pain was continuous, but in both the diagnosis of a ruptured vertebral disk had been made elsewhere and I consented to explore the region to clear the atmosphere. The other 2 with negative iodized oil injections were patients of Dr. George E. Bennett; in both of them I still thought a disk was present but found none. I am not sure that these may have been examples of the "concealed" disks that have since been found and will now be discussed.

"CONCEALED DISKS"

A concealed disk doubtless explains many negative explorations. There are ten of them in this series (28 per cent), eight of these in the past two months. The disk bulges so slightly that it would never be disclosed by iodized oil or air injections into the spinal canal

8. Love, J. G., and Walsh, M. N.: Intraspinal Protrusion of Intervertebral Disks, Arch. Surg. **40**: 454 (March) 1940.

9. Spurling, R. G., and Grantham, E. G.: Neurologic Picture of Herniations of the Nucleus Pulposus in the Lower Part of the Lumbar Region, Arch. Surg. **40**: 375 (March) 1940.

10. Love, J. G.: Protruded Intervertebral Disks, J. A. M. A. **113**: 2029 (Dec. 2) 1939.

11. Semmes, R. E.: Personal communication to the author.

and will be found at operation only by a careful inspection beneath the dura. The protrusion has been at or close to the midline beneath the cord in 6 and to the side in 4. They have been bound to the emerging spinal nerve by fairly firm adhesions. The spinal ligament over the involved disk is definitely thicker than normal. The slight protrusion is distinctly softer to touch than a normal disk and gives a definite sense of fluctuation to the forceps. When the covering ligament is incised a large sequestrum of cartilage does not protrude, but with almost no pressure the forceps sinks deeply into the intervertebral space—the certain test of a defective disk (the forceps cannot sink into a normal disk). As the forceps is withdrawn a soft mushy brownish material clings to the blades, and with a curet more of this material can be obtained from the cavity in the depths of the disk. At times small pieces of cartilage can be obtained in this way, but the material is reddish brown instead of the pearly white sequestrum that obtains in the protruding elevated disk with a definite sequestrum. When placed under the microscope the material contains remains of cartilage cells but in a much more disintegrated matrix than in the fairly normal looking cartilaginous sequestrum in the protruding disks. There are no signs of inflammatory process in the gross or under the microscope.

From time to time in the past I have encountered this type of disk, i. e. without a well defined sequestrum. The results following the opening of these flat disks have been just as good as when a large sequestrum has been removed, probably because the incision provides a vent for the subsequent gradual escape of the contained injured disk. I am confident that the same material is present in the depths of the disk, even when a large sequestrum is found, and that the opening of the cavity is essential for a cure. Always the forceps will fall without pressure into this central cavity. Three of these concealed disks had had iodized oil (one elsewhere) with negative results, and one had been operated on in another hospital with negative findings. The symptoms of these concealed disks are precisely like those of the protruding ones; they cause root pains because they are adherent to the nerve and not from mechanical pressure on them.

The disclosure of this concealed type of disk is an additional reason for giving up iodized oil, air or other tests. They can't possibly show the lesion, and with negative evidence the patient may well be deprived of operative cure and passed along as neurasthenic.

The question has repeatedly been asked Has not the diagnosis and treatment of ruptured intervertebral disks been greatly overdone and are not the findings at operation often so equivocal as to be merely a cloak for the operator's mistake? There is no question that many mistakes have been made and are still being made; that is natural for a field in its infancy. At the present time I am confident that with a knowledge of the "concealed" disks the percentage of error in the hands of skilled neurosurgeons will be very small. And I am equally confident that instead of being overdone the surface has only been scratched; that the overwhelming percentage of cases with recurring attacks of low back pain plus sciatica in one or both legs will be found to be vertebral disks. Love, who has done so much to develop this field of surgery, has had over 1,000 cases. There are, of course, many cases of constant pain that are not due to vertebral disks, and most of them are of psychogenic origin; they will fail to give exacerbation of pain on coughing or sneezing—a sign that I regard as pathognomonic of a disk or possibly a tumor. Doubtless there are some disks also among the constant backaches, even when there is no increase of pain on coughing or sneezing. These cases for the present must be classified separately. It is largely from this group that the negative spinal injections and operative exposures have been made and have cast some discredit on the whole subject. While it is worth while to cull a few disks from this large group, the diagnostic and operative efforts will be avoided by the most discriminating surgeons and the efforts confined to those cases that show reasons for doubting the psychologic diagnosis. But if cases in this group are to be considered as potential disks, and in cases of sufficient doubt further diagnostic efforts are to be made, my very strong feeling is that a unilateral exploration of the fourth and fifth disk areas is much preferable to intraspinal injections. The former exhausts the diagnostic possibilities, the latter, if negative, still do not exclude this lesion.

One other type of lesion must always be considered in the differential diagnosis, namely tumors of the spinal cord. Love has told me that this is his main reason for using air injections. It is true that occasional disks may be located at the third lumbar interspace, or even higher in the thoracic or cervical regions, and occasionally there may be two disks at different levels. However, the symptoms are sufficiently different to make one doubt the typical lesion at the fourth and fifth disks. At the third lumbar disk the pain will be in the front of the thigh instead of the back of the leg. And with higher disks the symptoms will scarcely be different from those of a tumor; most of them are found when tumors are suspected. It is only with the typical story of a disk at the fourth or fifth (and again these are 96 per cent of the total) that I eliminate the intraspinal diagnostic tests. For the occasional case in doubt I still prefer a small injection of iodized oil (usually 1 cc.), which is carefully studied under the fluoroscope. Although I dislike iodized oil it still remains a necessary test in localizing tumors of the spinal canal. Air shadows are never so good and the air is soon lost; iodized oil remains and can be restudied. With use of the fluoroscope the small amount of iodized oil is just as serviceable as the large quantities that fill the entire lumbar canal.

Many writers advise spinal fusion following removal of a ruptured disk, some almost routinely, others largely in industrial cases in which heavy work must be resumed. I have never felt this to be advisable. So far I have not had a recurrence, and in 500 cases Love reported only 1 per cent of recurrence. Where compensation is a factor a fusion will not diminish the complaints, and in cases with hard labor ahead a rest of three months is probably adequate protection.

SUMMARY

1. The overwhelming percentage of vertebral disks can be diagnosed and localized by the history and examination alone, and all accessory diagnostic tests (even lumbar punctures) can and should be avoided.

2. "Concealed" vertebral disks doubtless explain many of the negative explorations for this lesion.

3. If the diagnosis is questionable, an exploration of the region is preferable to spinal injections of air or iodized oil.

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THE TREATMENT OF PNEUMOCOCCIC PNEUMONIA WITH SULFADIAZINE

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Extensive clinical use has established beyond doubt the value of sulfapyridine and sulfathiazole in the treatment of pneumococcic pneumonia. Among the many similar compounds that have been synthesized, one in particular has shown sufficient promise in preliminary studies to be worthy of clinical trial. This compound, sulfadiazine (2-sulfanilamidopyrimidine) is the pyrimidine analogue of sulfapyridine, synthesized by Roblin and his associates.[1] Feinstone and his co-workers[2] administered sulfadiazine to various laboratory animals and obtained higher average blood levels than after the administration of similar dosages of sulfapyridine or sulfathiazole. The therapeutic effects with sulfadiazine were equal or superior to those with sulfapyridine or sulfathiazole, and the toxic reactions were less frequent. Studies on the absorption and excretion of sulfadiazine in human beings have been made by several groups of investigators[3] who agreed that higher levels of the drug in the blood were obtained and that these persisted over a longer period of time than after similar dosages of sulfapyridine or sulfathiazole. Toxic effects from sulfadiazine were less frequent than after the administration of either of the other two drugs.

Flippin, Rose, Schwartz and Domm[4] reported 11 deaths (12.6 per cent) among 87 patients with typed pneumococcic pneumonia as compared to 16 deaths among 86 patients treated with sulfathiazole. Finland, Strauss and Peterson[5] gave sulfadiazine in 178 similar cases and observed a 10.7 per cent mortality rate. They felt that the results in pneumococcic pneumonia were comparable to the best that they had obtained with sulfapyridine or sulfathiazole.

During the period from Dec. 15, 1940 to June 15, 1941 all adult patients with pneumococcic pneumonia in the wards of Gallinger Municipal Hospital were treated with sulfadiazine whenever the drug was available.[6] The sputums of all patients were typed for pneumococci, and one or more blood cultures and roentgenograms of the chest were obtained on each patient. Estimations of the sulfadiazine content of the blood were made at least once a day while the drug was being given. At the onset of the study an initial dose of 2 Gm. was administered by mouth, followed by 1 Gm. at four hour intervals until clinical improvement occurred. The drug was discontinued after the temperature had been normal for three or four days. Later in the study an initial dose of 4 or 6 Gm. was used, followed by 1 Gm. every four hours as before. A few patients were treated with a single dose of 6 Gm.

RESULTS

A total of 115 patients with pneumococcic pneumonia were treated (table 1). There were 13 deaths (11.3 per cent), 3 of which occurred within twelve hours and 1 within twenty-four hours of the time treatment was begun. Pneumococci were cultured from the blood stream of 17 (14.8 per cent) of these patients. Among the bacteremic patients 5 (29.4 per cent) died, as compared with 8 deaths (8.2 per cent) among 98 non-bacteremic patients. Sixty-four patients received the initial dose of sulfadiazine within the first four days of the disease. Four of these patients (6.3 per cent) died, while there were 9 (17.4 per cent) deaths among the 51 patients whose treatment was begun on the fifth day of the disease or later.

TABLE 1.—*Pneumococcic Pneumonia Treated with Sulfadiazine*

Type	All Cases		Bacteremic Cases		Cases Treated in First Four Days	
	Number	Died	Number	Died	Number	Died
I	35	2	4	0	19	1
II	4	0	0	..	4	0
III	9	3	3	1	5	1
IV	4	0	1	0	1	0
V	3	0	0	..	1	0
VI	4	0	1	0	3	0
VII	16	2	2	1	7	0
VIII	5	0	1	0	3	0
Other types	35	6	3	2	18	2
Total	115	13 (11.3%)	17	5 (29.4%)	64	4 (6.3%)

Sixteen patients received serum in addition to sulfadiazine, usually on the first or second day after administration of the drug was started. Most of these patients were in the older age groups and were treated because the outcome appeared to be uncertain on drug treatment alone. Two of these patients died, both of whom received only 80,000 units of serum. Bacteremia was present in 4 patients of this group, none of whom died.

In table 2 the mortality rates are shown in relation to the ages of the patients and the number of lobes involved. There were no deaths in the age group from 12 to 20 years, but from that point on the mortality rate increased progressively up to 50 per cent for the patients over 70 years of age. The death rate was higher among patients with two or more than two lobes involved (16.7 and 12.5 per cent, respectively) than among those with only one lobe involved (9.1 per cent).

The response of the patients according to the dosage of the drug is shown in table 3. The level of free sulfadiazine in the blood during the first twelve hours of

From the Health Department of the District of Columbia; the Department of Medicine, George Washington University School of Medicine, and the Gallinger Municipal Hospital.

Cooperation was given by Drs. G. C. Ruhland, J. G. Cumming and J. E. Noble of the Health Department of the District of Columbia and by the resident staff of Gallinger Municipal Hospital. Technical assistance was given by Miss Ruth Mayer, Miss Emily Godfrey and Mr. Norman E. Yongue.

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2. Feinstone, W. H.; Williams, R. D.; Wolff, R. T.; Huntington, Evelyn, and Crossley, M. L.: The Toxicity, Absorption and Chemotherapeutic Activity of 2-Sulfanilamidopyrimidine (Sulfadiazine), Bull. Johns Hopkins Hosp. **67**: 427 (Dec.) 1940.

3. Plummer, Norman, and Ensworth, H. K.: Absorption and Excretion of Sulfadiazine, Proc. Soc. Exper. Biol. & Med. **45**: 734 (Nov.) 1940. Reinhold, J. G.; Flippin, H. F.; Schwartz, Leon, and Domm, A. H.: The Absorption, Distribution and Excretion of 2-Sulfanilamidopyrimidine (Sulfapyrimidine, Sulfadiazine) in Man, Am. J. M. Sc. **201**: 106 (Jan.) 1941. Peterson, O. L.; Strauss, Elias; Taylor, F. H. L., and Finland, Maxwell: Absorption, Excretion and Distribution of Sulfadiazine (2-Sulfanilamido-Pyrimidine), ibid. **201**: 357 (March) 1941. Sadusk, J. F., Jr., and Tredway, J. B.: Observations on the Absorption, Excretion, Diffusion and Acetylation of Sulfadiazine in Man, Yale J. Biol. & Med. **13**: 539 (March) 1941. Long, P. H.: The Clinical Use of Sulfanilamide, Sulfapyridine, Sulfathiazole, Sulfaguanidine and Sulfadiazine in the Prophylaxis and Treatment of Infections, Canad. M. A. J. **44**: 217 (March) 1941.

4. Flippin, H. F.; Rose, S. B.; Schwartz, Leon, and Domm, A. H.: Sulfadiazine and Sulfathiazole in the Treatment of Pneumococcic Pneumonia: A Progress Report on 200 Cases, Am. J. M. Sc. **201**: 585 (April) 1941.

5. Finland, Maxwell; Strauss, Elias, and Peterson, O. L.: Sulfadiazine. Therapeutic Evaluation and Toxic Effects on Four Hundred and Forty-Six Patients, J. A. M. A. **116**: 2641 (June 14) 1941.

6. Sulfadiazine was obtained through the courtesy of Drs. W. G. Malcolm and D. A. Bryce of the Lederle Laboratories, Inc.

treatment was in general proportional to the amount of the initial dose. In spite of this fact there was no difference in the elapsed time from the initial dose of sulfadiazine until the temperature fell and remained below 101 F., regardless of whether the initial dose

TABLE 2.—*Mortality Rate in Relation to Age of Patients and Number of Lobes Involved*

Age Group	Number of Cases	Number Died	Per Cent Died
12-20	17	0	0
21-30	29	1	3.4
31-40	30	4	13.3
41-50	19	1	5.3
51-60	10	2	20.0
61-70	8	4	50.0
Over 70	2	1	50.0
Number of Lobes Involved			
1	77	7	9.1
2	30	5	16.7
More than 2	8	1	12.5

was 2, 4 or 6 Gm. Four of the 7 patients who received a single dose of 6 Gm. responded with a rapid drop in temperature, while the temperature of 3 patients remained high and the symptoms unabated for more than twenty-four hours. Two of these required further sulfadiazine therapy.

If all the cases are considered, irrespective of dosage, it will be seen that the temperature fell in 39.1 per cent of the group within twenty-four hours of the beginning of treatment while in 29.6 per cent the temperature did not fall until after twenty-four hours had elapsed. The 23 remaining patients who recovered (20 per cent) either had a drop of temperature within three hours of starting therapy or received serum before a drop in temperature took place.

We tested the blood serum of 71 patients (obtained before treatment was commenced) for the presence of the soluble specific substance of the infecting pneumococcus, according to the method of Bukantz and de Gara.[7] The polysaccharide could not be demonstrated in the serum of 66 patients (table 4), among whom 3, or 4.5 per cent, died. There were 2 deaths (40 per cent) among the 5 patients in whom the specific soluble substance was detected.

TABLE 3.—*Relation of Dosage to Outcome*

Dose (Gm.)		Average Free Blood Sulfadiazine Levels, Mg./100 Cc., at			Temperature Dropped to 101 F. in				
Initial	Every 4 Hrs.	3 Hrs.	6 Hrs.	12 Hrs.	4-24 Hrs.	Over 24 Hrs.	Other Cases	Died	Total
2	1	1.4	4.1	4.8	17	2	5	1	25
4	1	2.5	4.5	6.5	4	11	3	4	22
6	1	3.5	4.9	5.2	18	15	12	6	51
6	..	4.8	5.6	6.0	4	3	0	0	7
Irregular		...	...	...	2	3	3	2	10
All cases		...	...	...	45	34	23	13	115
Percentage		...	...	...	39.1	29.6	20.0	11.3	100

Complications of the pneumonia occurred in 6 patients. Three of these had empyema. Two recovered completely following frequent aspirations, while 1 recovered after thoracotomy. One patient had fibrinous pericarditis and 1 had thrombophlebitis. Both recovered. The only patient to die from a complication had a type XIV pneumococcus pneumonia and endocarditis. Since it was impossible to determine the exact time of onset of the endocarditis, it is more than likely that it was present before treatment was begun. The patient died in spite of continued sulfadiazine therapy.

Table 4 shows the toxic reactions from the use of sulfadiazine in 137 patients. This group includes the 115 patients with pneumococcic pneumonia, 9 patients with clinical and roentgen ray evidence of pneumonia whose sputum contained no pneumococci on repeated examinations, and 13 patients suffering from nonpneumococcic diseases, such as influenza, acute bronchitis, brucellosis and tuberculosis. Six patients, or 4.4 per cent, suffered from mild or moderately severe vomiting. It was never severe enough to require discontinuing the drug. One patient had acute hemolytic anemia with recovery following cessation of drug therapy. Three patients exhibited a depression of the leukocyte count to 3,000 per cubic millimeter in 2 cases and 3,500 in 1 case. The white blood cell counts returned to normal in every case after the drug was stopped. In 1 patient there was a leukemoid reaction (without hemolytic anemia), the leukocytes reaching a peak of 63,700 per cubic millimeter with a concomitant increase in the younger forms of the neutrophilic series, all of which returned to normal within ten days of the cessation of sulfadiazine treatment.

TABLE 4.—*Toxic Reactions in One Hundred and Thirty-Seven Cases*

Reaction	Number of Cases	Per Cent
Nausea and vomiting		
Slight or moderate	6	4.4
Severe	0	...
Acute hemolytic anemia	1	0.7
Leukopenia	3	2.2
Leukemoid reaction	1	0.7
Toxic psychosis	4	3.0
Xanthopsia	1	0.7
Drug fever	4	3.0
Retention of blood urea nitrogen	2	1.5
Total	22	16.2

Four patients were delirious during the period of drug administration. One patient had slight mental confusion and yellow vision for two days, while the free sulfadiazine in the blood fluctuated between 10 and 12 mg. per hundred cubic centimeters. Both symptoms subsided promptly when the drug was stopped.

Drug fever occurred in 4 patients. One of these patients was subsequently given 3 Gm. of sulfadiazine and exhibited a prompt recurrence of the fever, whereas neither sulfathiazole, sulfapyridine nor sulfanilamide caused any rise in the patient's temperature.

Evidence of renal lithiasis was not observed in any of the patients. Sulfadiazine crystals were found less frequently in the urine than sulfapyridine or sulfathiazole crystals during administration of the latter drugs in similar dosages. The blood urea nitrogen of 2 patients became elevated after the administration of sulfadiazine. Since the urea nitrogen levels of both patients remained below 50 mg. per hundred cubic centimeters, and there were no other evidences of renal disease, it is difficult to determine whether this mild azotemia was due to the disease or to the sulfadiazine. There were no fatalities as the result of toxic reactions.

COMMENT

The problem of the adoption or rejection of a new member of the sulfonamide group may be approached by determining how closely the new compound approximates the ideal sulfonamide. Such an ideal drug would

7. Bukantz, S. C., and de Gara, P. F.: The Detectability of Pneumococcal Capsular Polysaccharide and Antibody in Blood, Broth and Saline Solution (Optimal Concentration of Antigen and Antibody), J. Immunol. 39: 195 (Sept.) 1940.

be flexible in its modes of administration, would produce no toxic or sensitivity effects in the host and would be therapeutically active against a broad group of common infecting agents. That this ideal has not yet been achieved is evident, but we believe from our results that sulfadiazine more nearly approaches it than sulfathiazole or sulfapyridine.

We have confirmed the results of other observers that sulfadiazine is rapidly absorbed from the gastrointestinal tract, that the blood levels obtained are usually higher than with comparable doses of sulfapyridine and sulfathiazole and that excretion takes place slowly. All these factors, combined with the infrequency of vomiting, make for ease of administration.

With regard to therapeutic effects, the mortality rate of 11.3 per cent obtained in a series of 115 pneumococcic pneumonia patients treated with sulfadiazine is similar to the rate of 11.5 per cent obtained by us in the treatment of 356 patients with sulfapyridine and dextrose sulfapyridine during the past three years. We have treated 75 patients with sulfathiazole during this past season when sulfadiazine was not available, of whom 10, or 13.3 per cent, died.

Flippin and his associates [4] found a death rate of 12.6 per cent among 87 patients with pneumococcic pneumonia treated with sulfadiazine, and 16.1 per cent among 86 patients treated with sulfathiazole. Finland, Strauss and Peterson [5] compared the mortality rate of 10.7 per cent obtained by them in 178 patients with pneumococcic pneumonia treated with sulfadiazine with that of 16.3 per cent obtained during the previous season in a similar series of patients treated with sulfapyridine and sulfathiazole.

The presence of the capsular polysaccharide in the serum of pneumonia patients has been repeatedly found to be evidence of a severe infection with grave prognosis. Bukantz, de Gara and Bullowa [8] were able to detect it in 16 patients out of 135 tested. Ten of these patients (62.5 per cent) died after treatment with sulfapyridine, specific serum or both. We were able to detect the polysaccharide in 5 patients, of whom only 2 died. This evidence, together with the comparisons cited, indicates that sulfadiazine is comparable in therapeutic efficiency to sulfapyridine and sulfathiazole.

As shown in table 4, the toxic effects observed by us among 137 patients treated with sulfadiazine were minimal, the most frequent being vomiting in 4.4 per cent of the patients. It was never severe and did not prevent continued oral administration of the drug. It was less frequent and less severe than that which occurred in our patients treated with sulfapyridine, sulfathiazole or a dextrose sulfapyridine compound. An unusual toxic reaction was yellow vision, which occurred in a patient with relatively high blood levels and was presumably due to the sulfadiazine. It disappeared promptly when the drug was stopped. All the other toxic reactions were mild and transitory.

It appears that sulfadiazine approaches the ideal sulfonamide drug more closely than sulfapyridine or sulfathiazole, because of less toxicity, and that it is equal to these drugs in therapeutic efficiency. If these results are confirmed, sulfadiazine should be considered the present drug of choice in the treatment of pneumococcic pneumonia.

8. Bukantz, S. C.; de Gara, P. F., and Bullowa, J. G. M.: Capsular Polysaccharide in the Blood of Patients with Pneumococcal Pneumonia; Detection, Incidence, Prognostic Significance and Relation to Therapies, Arch. Int. Med., to be published.

SUMMARY

1. One hundred and thirty-seven patients were treated with sulfadiazine. Among 115 patients with typed pneumococcic pneumonia there were 13 deaths (11.3 per cent) and among 17 bacteremic cases 5 deaths (29.4 per cent).

2. Toxic reactions were infrequent. Slight or moderate vomiting occurred in 4.4 per cent of all patients, toxic psychoses in 3 per cent and other toxic reactions less frequently.

3. There are apparent advantages of sulfadiazine over other drugs in the treatment of pneumococcic pneumonia.

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ROENTGEN THERAPY FOR RHEUMATOID ARTHRITIS OF THE SPINE

(MARIE-STRÜMPELL ARTHRITIS; SPONDYLITIS RHIZOMÉLIQUE)

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In a recent report we [1] reviewed our experiences with roentgen therapy in the treatment of 100 patients with various types of rheumatic disease. At that time it was concluded that the results in patients with multiple rheumatoid arthritis were unpredictable, unreliable and less satisfactory than was claimed by most other observers, but that in patients with rheumatoid arthritis of the spine (commonly called Marie-Strümpell arthritis or spondylitis rhizomélique) the results were encouraging. Of the 15 patients studied at that time 67 per cent showed definite evidence of improvement; some were completely relieved of symptoms, and in 2 with early involvement there was almost complete disappearance of all clinical evidence of disease. Because of these results we concluded: "We are quite encouraged with the possibilities of roentgen irradiation in this type of arthritis, and we are studying it further." Since that time we have observed the results of such treatment in 37 additional cases, and it is our purpose in this report to analyze the results obtained in the entire group.

The earliest report we have found of the use of roentgen therapy for rheumatoid arthritis of the spine is that of Kahlmeter [2] in 1930. He stated that of 155 patients with different types of arthritis treated by roentgen therapy 3 had rheumatoid arthritis of the spine; 1 of these became symptom free, and the other 2 were improved. In 1935 Scott [3] reported that "wide field" roentgen irradiation (technic to be discussed hereafter) was beneficial to patients with "spondylitis adolescens" ("rhizomélique"). In subsequent reports this author has claimed remarkable results with such

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From the Rackham Arthritis Research Unit and the Department of Roentgenology, Division of Radiation Therapy, University of Michigan Medical School.

1. Smyth, C. J.; Freyberg, R. H., and Peck, W. S.: Roentgen Therapy for Rheumatic Disease, J. A. M. A. **116**: 1995-2001 (May 3) 1941.

2. Kahlmeter, Gunnar: The Roentgen Treatment of Arthritis, Brit. J. Actinotherapy **5**: 93 (Aug.) 1930.

3. Scott, S. G.: X-Ray in Chronic Rheumatic Arthritis: Diagnosis, Prognosis and Treatment, Brit. J. Phys. Med. **10**: 127-128 (Dec.) 1935.

roentgen therapy, and in his monograph [4] (1939) he summarized results in more than 400 cases in which treatment was given in various stages of this disease. Patients with early disease responded best and often became symptom free within a few months. Recently Scott has been criticized [5] because of his failure to present statistical or clinical details.

Kemen [6] in 1936 treated 536 patients with rheumatic disease with roentgen therapy; among these he listed 77 with rheumatoid arthritis of the spine. His technic was similar to ours. His results were "surprisingly good: At the completion of treatment 33 patients were substantially improved, 34 improved and 10 uninfluenced. Of the 29 observed at the end of four to six months 19 were further improved."

Hare [7] in 1940 stated that of 35 patients with rheumatoid arthritis of the spine whom he treated with roentgen radiation, 80 per cent were relieved of pain. He treated the entire spine and the sacroiliac joints.

Weinberg [8] reported the results of roentgen treatment of 161 patients with "arthritis and para-arthritis"; among this group, 90 were said to have "spondylitis." After careful examination of the limited data describing these patients, we are convinced that the majority probably did not have rheumatoid arthritis of the spine but were suffering from osteoarthritis of the spine or from nonarticular rheumatism of the back. We therefore are unable to evaluate the results he obtained with rheumatoid arthritis of the spine.

METHOD OF STUDY

Only patients for whom the diagnosis of rheumatoid arthritis of the spine was established by history, physical signs, roentgenographic examination and elevation of the rate of erythrocyte sedimentation were selected for this study. The patients were divided into three groups, primarily on the basis of roentgenographic changes: (1) early disease—those with roentgenographic changes limited to the sacroiliac joint; (2) moderately advanced disease—those with a partly or completely obliterated sacroiliac joint and with calcification of longitudinal spinal ligaments over several segments, and (3) far advanced disease—those in whom the sacroiliac joint was completely ankylosed and those in whom extensive paravertebral ligamentous calcification and obvious involvement of the apophysial joints occurred, with or without involvement of the girdle joints.

The technic of roentgen therapy was as follows: Two hundred kilovolts (175 kilovolts constant potential equivalent) was used, with 0.5 mm. of copper and 1 mm. of aluminum filtration, a half value layer of 0.9 mm. of copper, a 50 cm. skin-target distance and an output of 50 r (measured in air) per minute, with the usual size of the field approximately 200 to 300 square centimeters. In the earlier part of our investigation, each field was treated three times, with 200 r (measured in air) each time. The treatments were given every other day; thus the total dose per field was 600 r. Such therapy hereafter will be referred to as "a series of treatments." More recently, the total dose administered to a field (in a "series of treatments") has been reduced to about 300 r, 150 r being given every other day. Usually three series were given at monthly intervals to the same area. If symptoms were not completely relieved or recurred, or if they developed in new areas, additional treatment was given. All or any portions of the spine (cervical, dorsal, lumbar or sacral) and the sacroiliac joint, or any combination of these regions, were irradiated. The parts selected for treatment were determined by the symptoms and physical signs. In several cases of far advanced disease, involved shoulder and hip joints were also treated.

During the course of treatment and throughout the subsequent period of observation all patients were interviewed frequently. Questions that were in no way leading were asked in order to learn the subjective response, and examinations by the same physician were made frequently to detect physical changes, especially in regard to range of motion, chest expansion and paravertebral and sacroiliac tenderness. The rate of sedimentation of the erythrocytes was frequently determined by the Rourke-Ernstene technic.[9] In many cases roentgenograms of the spine before and after treatment were compared; in all white blood cell counts were determined before, during and after each series of treatments.

In order to study the possible psychic effect of such treatment, in a few cases a lead screen was used to prevent the roentgen rays from reaching the diseased part. In some instances this control technic was employed before any roentgen therapy was given, and in others it was used between series of roentgen treatments. Care was taken that the patient did not know when such placebo therapy was being used.

The patients have been treated during a three year period, and in most instances we have been able to make frequent follow-up examinations. Two patients have been observed for twenty-seven months after treatment, 14 for one to two years, 11 for six to twelve months, 11 for three to six months and the remaining 14 for approximately three months.

RESULTS

The results in 52 cases in which roentgen therapy was given have been analyzed in regard to clinical changes, both subjective and objective, and also by laboratory methods. The influence of therapy on pain, stiffness, motion of the spine and hips and general disability have been considered in our study of the symptomatic changes. Evidence of objective clinical improvement was determined by frequent examinations of the range of motion of the spine and hips, chest expansion, degree and distribution of paravertebral muscular tenderness, sacroiliac tenderness and, in most cases, body weight. The degree of improvement was graded 1, 2, 3 or 4 to indicate increasing benefit. We have considered improvement of grade 2 (moderate), 3 (striking) or 4 (disappearance of symptoms and physical signs) as significant, and hereafter reference to improvement or "significant improvement" should be understood to mean improvement of grade 2 or more.

A large percentage of the patients have improved significantly. In some, especially patients with early disease, striking relief of symptoms, particularly pain, occurred soon after the first series of treatments and there was continued gradual improvement to the point of complete disappearance of all clinical evidence of the disease. We were surprised and pleased to observe that some patients with partial calcification of liga-

4. Scott, S. G.: Wide Field X-Ray Treatment, London, George Newnes, Ltd., 1939.

5. Hench, P. S.; Bauer, Walter; Dawson, M. H.; Hall, Francis; Holbrook, W. P.; Key, J. A., and McEwen, Curvier: The Problem of Rheumatism and Arthritis, Ann. Int. Med. **13**: 1937 (April) 1940.

6. Kemen, A.: Röntgenbehandlung der rheumatischen Erkrankungen, insbesondere der Bechterewschen Erkrankung, Verhandl. d. deutsch. Gesellsch. f. inn. Med., abstr. **49**: 46-54, 1937.

7. Hare, H. F.: The Diagnosis of Marie-Strümpell Arthritis with Certain Aspects of Treatment, New England J. Med. **223**: 702-705 (Oct. 31) 1940.

8. Weinberg, T. B.: Arthritis and Para-Arthritis Treated with the Roentgen Ray, Am. J. Roentgenol. **43**: 416-424 (March) 1940.

9. Rourke, M. D., and Ernstene, A. C.: A Method for Correcting the Erythrocyte Sedimentation Rate for Variations in the Cell Volume Percentage of Blood, J. Clin. Investigation **8**: 545-559 (June) 1930.

ments showed a significant increase of motion and chest expansion when the pain in the back was relieved. The beneficial effects, whether partial or complete, have persisted in most patients throughout the period of observation. For those whose symptoms recurred several months after therapy, additional treatments usually proved effective in producing relief. Most persons

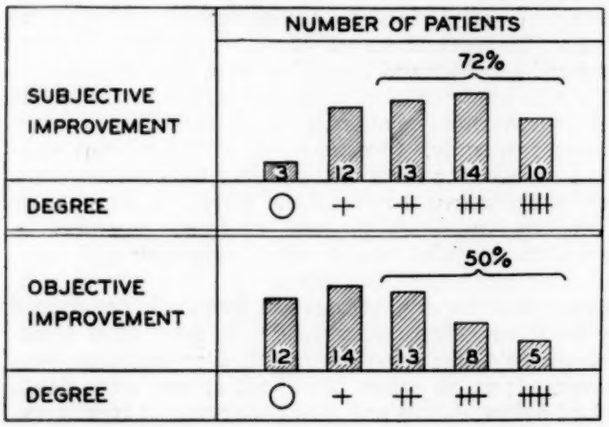

Chart 1.—Clinical results in 52 patients with rheumatoid arthritis of the spine treated with roentgen therapy.

reported improvement within the first week after the beginning of treatment, and frequently patients insisted that within a few hours after therapy a decided reduction in pain and stiffness had occurred. In others, no change was evident until after the second series of treatments and the improvement was generally slower and less. If there was no improvement after either the first or second series, the possibility of benefit with additional irradiation was slight.

The results of our clinical observations, irrespective of the duration of symptoms, activity of the disease or extent of involvement, are summarized in chart 1. Thirty-seven of the 52 patients (72 per cent) obtained a significant degree of subjective benefit, whereas 26 (50 per cent) were significantly benefited in regard to objective clinical changes.

The clinical results in relation to the extent of the disease as measured primarily by roentgenographic examination are summarized in chart 2. Twelve (92 per cent) of the 13 patients with early disease were significantly improved both subjectively and objectively. Thirteen (68 per cent) of the 19 with moderately advanced disease reported significant symptomatic improvement, and 7 (37 per cent) showed significant objective clinical improvement. Fifteen (65 per cent) of the 20 in the group with far advanced disease showed a significant degree of subjective improvement, whereas only 7 (35 per cent) manifested physical signs of improvement.

The clinical results have been studied to determine what correlation, if any, exists between the duration of symptoms prior to treatment and the degree of improvement (chart 3). We have separated the patients into three groups: those who have had symptoms for less than two years, 13; those who have had symptoms for two to eight years, 22, and those with symptoms for more than eight years, 17. Of the first group, 85 per cent were significantly benefited subjectively and 69 per cent objectively. Among the second group 50 per cent reported significant relief of symptoms and 36 per cent were improved as judged by physical changes. Rather surprisingly, the highest percentage of subjective improvement, 88, occurred in group 3, but in this group significant objective benefit was found in only 41 per cent.

It was shown in our study of patients with multiple rheumatoid arthritis, by using lead screens to protect the parts from irradiation, that in many cases symptomatic improvement following roentgen therapy was psychogenic. We employed the same technic in some cases of rheumatoid arthritis of the spine. None of the patients protected from irradiation by lead screens showed significant improvement, but without exception when they were later treated with roentgen rays significant improvement occurred. Other patients were treated first with irradiation directed to one area of the spine, and improvement was noted only in the area treated; later a different area of the spine was treated, but with a lead screen, and almost uniformly no beneficial effect followed.

Changes in the Rate of Sedimentation of the Erythrocytes.—Patients with rheumatoid arthritis of the spine usually have an elevated erythrocyte sedimentation rate, and reductions in rate are considered by most students of arthritis to indicate improvement in the disease process. Determination of the rate was repeated often enough for 32 of the 52 patients to provide another objective method of evaluating results. (We considered no change in rate significant unless it was 0.3 mm. per minute or more and unless such a change persisted throughout the period of observation.) Thirteen of the 32 patients, or 41 per cent, showed a significant decrease in the erythrocyte sedimentation rate. In all except 1 of these 13 there was significant clinical improvement. Although exceptions occurred, in general the greatest reductions in the rate were found in patients in the early or the moderately advanced stage of the disease and accompanied the more remarkable clinical improvement. Likewise, smaller changes or no change in sedimentation rate generally occurred in patients with more advanced disease and in those who improved to a lesser degree. In 3 patients (9 per cent) a significant increase in the rate occurred, and each showed only symptomatic improvement and that of only moderate degree.

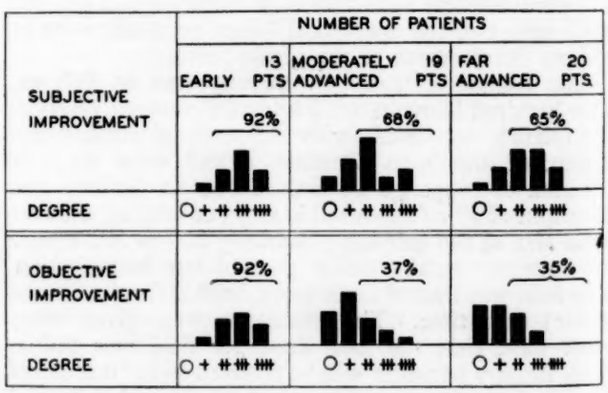

Chart 2.—Clinical results in relation to extent of disease.

Changes in the Roentgenographic Appearance of the Treated Areas.—Seventeen patients were examined roentgenographically from six months to two years after therapy. In none was any evidence of anatomic improvement demonstrated. In 8 there was an increase in calcification of the paravertebral ligaments, and in 5 of these significant clinical improvement and reduction in the erythrocyte sedimentation rate had occurred.

Ill Effects.—The only potentially serious ill effect we have encountered to date is leukopenia. Although moderate transient decreases in the number of circulating leukocytes occurred not uncommonly, in only 3 patients of the entire group was significant leukopenia observed. In each one this change in the blood occurred after the second series of treatments to the entire spine, given with the technic employing the larger amount of irradiation (600 r to each of three or four parts). The lowest counts were 3,400, 1,700 and 1,100 cells per

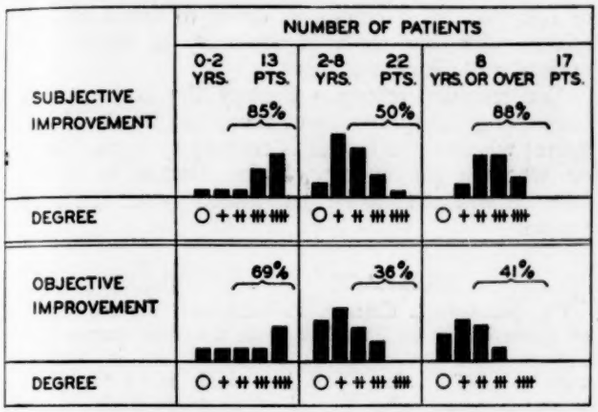

Chart 3.—Clinical results in relation to duration of disease.

cubic millimeter. The decrease was chiefly in lymphocytes in 1 patient and in all elements of the white cell series in the other 2. In none were there associated clinical consequences of this depression of the leukocytes, and complete recovery occurred in all within one month.

Symptoms referable to the gastrointestinal tract were common; anorexia, nausea and vomiting occurred as a rule when the lumbar and dorsal parts of the spine were treated. These symptoms usually began four to six hours after therapy and always completely subsided in two or three days. They were slightly more severe when larger amounts of radiation were given. In several cases large amounts of thiamine hydrochloride, administered either intramuscularly or orally, were of no value in controlling or preventing such sickness.

Temporary depilation over the neck resulted in 2 patients treated early in the series; for this reason we commonly avoided irradiation above the hairline in patients subsequently treated.

COMMENT

The results clearly indicate that roentgen irradiation is a valuable means of treatment for rheumatoid arthritis of the spine. The patients who had early disease received the greatest benefit; remarkable reduction of all symptoms, especially pain and stiffness, increase in chest expansion and spinal motion and sustained gains in body weight were almost universaly observed. Some of these patients felt entirely well after treatment and returned to gainful occupations, often hard manual labor. The patients in the later stages of the disease, whose roentgenograms showed calcification of spinal ligaments, although frequently significantly improved, continued to have limitation in spinal motion and other disability due to anatomic changes. Because of the much more dramatic results of treatment during the early stage of rheumatoid arthritis of the spine we believe it is of great importance to recognize the disease early in its course and institute treatment then. If the disease process can be arrested it is advantageous that this be accomplished before disabling abnormal calcification and ankylosis result.

There may be a question concerning the diagnosis of rheumatoid arthritis of the spine in our patients "with early disease," who showed changes in the sacroiliac joint as the only roentgenographic abnormality. It has been emphasized [10] that sacroiliac arthritis often (but not always) is the earliest roentgen sign of this disease. However, the existence of sacroiliac arthritis does not necessarily signify the inevitable development of spinal arthritis. In all our patients "with early disease," with roentgenographic abnormalities present only in the sacroiliac joint, the existence of marked restriction of spinal motion in the lumbar and even the dorsal region, the gross diminution in chest expansion, the progressive loss of weight and disability, together with elevated erythrocyte sedimentation rates, left no doubt in our minds that the condition was characteristic rheumatoid arthritis of the spine (Marie-Strümpell arthritis; spondylitis rhizomélique).

It should be pointed out that in the majority of our patients treated by roentgen radiation the predominant change has been the partial, and in some instances complete, control of symptoms, especially pain and stiffness. Some of the observed objective improvements, namely the increase in chest expansion and spinal motion, the reduction in paravertebral muscular tenderness and the improvement in general disability, may be entirely the result of the reduction in pain. Whether this control of symptoms is the only value of roentgen treatment or whether the course of the disease is actually checked is an important question. The facts that the symptomatic improvement continues so long in some patients and that the erythrocyte sedimentation rate decreases in many, especially those with early disease, suggest that the course of the disease may have been favorably altered.

However, the lack of complete correlation between the erythrocyte sedimentation rate and the clinical changes, together with the realization that numerous factors may alter the sedimentation rate, does not allow determination of the rate definitely to settle the question. The finding of increased calcification of spinal ligaments in some patients symptomatically improved may throw doubt on the arrest of the disease; on the other hand, this increased calcification may not result from continued active inflammation but may be actually part of a healing process. Obviously, therefore, additional clinical observations and years of follow-up study on cases of rheumatoid arthritis of the spine and other cases will be necessary before final evaluation of the effects of roentgen irradiation on the course of the disease can be made.

The treatment we have employed is a form of local high voltage roentgen therapy. In this respect it is similar to the technic of Kahlmeter,[2] Kemen,[6] Swaim [11] and Hare,[7] although certain factors are different. As yet there is no recognized standard technic of roentgen irradiation for rheumatoid arthritis of the spine; factors such as dosage, size of ports and frequency of irradiation are being investigated by the few persons studying this type of treatment in an attempt to learn the optimal technic. Because we observed leukopenia in 3 patients,

10. Lassen, N.: Spondylarthritis Ankylopoietica: Remarks Concerning Early Diagnosis, Ugesk. f. læger **101**: 1307-1312, 1939. Scott, S. G.: Radiology and the Rheumatic Backache, J. Roy. Inst. Pub. Health & Hyg. **1**: 236-244 (Jan.) 1938. Forestier.[12]

11. Swaim, L. T.: Proceedings of the American Rheumatism Association, 1940, J. A. M. A. **115**: 2207-2210 (Dec. 21) 1940.

we reduced the dosage per field, hoping we would avoid undesirable changes in the blood (and irradiation gastrointestinal sickness) and retain the satisfactory therapeutic results. We have observed significant beneficial effects with the modified therapy and to date have observed no undesirable changes in the blood; however, our experience with smaller amounts of irradiation is insufficient to allow final evaluation. We strongly advise that undesirable changes in the blood, especially leukopenia, be looked for by all persons using roentgen irradiation for rheumatoid arthritis of the spine, especially if treatment is given over the entire spine. Our present practice is to determine the leukocyte count before each irradiation, and if a progressive decrease in leukocytes is found treatment is discontinued, at least temporarily. Gastrointestinal disturbances have not been reduced by using a smaller amount of radiation.

Because of the possibility of sterilization in the female if large amounts of roentgen radiation are directed over the pelvis, we have never given more than a total of 300 r over the female pelvis in a series of treatments.

Scott [4] reported excellent results in patients with "spondylitis adolescens" ("rhizomélique") by the use of a special technic of roentgen irradiation which he called "wide field" therapy.[12] We have critically examined a patient with early rheumatoid arthritis of the spine several times before and after he was treated by Scott, and we are convinced of the remarkable clinical and laboratory improvement which followed. Recently we have employed wide field irradiation on 2 patients, following the technic of Scott in every essential detail. It will be necessary to study more patients treated in this way before final evaluation of the effect can be made.

We are unable to find any adequate explanation of the way in which roentgen rays act to produce the changes which we have observed. This subject was discussed in our earlier report,[1] and we have no new information relative to the rationale of treatment. In this regard it is interesting to note that Forestier [13] treated 25 patients with rheumatoid arthritis of the spine with radon injected subcutaneously. He reported excellent results and expressed the belief that, if such treatment is sufficiently pursued, complete arrest of the disease can be accomplished.

SUMMARY

Fifty-two patients with typical rheumatoid arthritis of the spine were treated with local high voltage roentgen radiation over the spine. Considering all patients irrespective of the extent of involvement, duration of symptoms or activity of the disease, 37 (72 per cent) were significantly improved with reference to symptoms and 26 (50 per cent) were significantly improved as judged by physical findings. The results were excellent in the patients with early disease, in whom roentgenograms revealed abnormalities only in the sacroiliac joint; in this group 92 per cent showed significant, sustained, subjective and objective improvement, and some were completely relieved of all clinical evidence of the disease. In the later stages, after spinal ligamentous calcification had occurred, we were surprised to find that a high percentage showed significant reduction in pain and stiffness and in some cases objective improvement. We found no evidence for a psychogenic basis for symptomatic relief.

The erythrocyte sedimentation rate decreased significantly after roentgen therapy in 41 per cent. Leukopenia was found in 3 patients, but all recovered completely within one month after therapy. We consider leukopenia a potential danger associated with roentgen therapy and wish to emphasize the advisability of frequent blood counts in order to avoid serious ill effects. Further study is necessary to determine the optimal technic of treatment.

We consider roentgen therapy the best method of controlling the symptoms of rheumatoid arthritis of the spine; whether the benefit is entirely symptomatic relief or whether the course of the disease is favorably affected will need to be determined by further investigation.

12. Scott used a special wide angle x-ray tube to deliver a "roentgen ray bath" to the whole trunk, front and back, which are covered by two overlapping 12 inch (30.4 cm.) fields. The physical factors were 140 kilovolts, a filter of 3 mm. of aluminum and 60 to 100 r, with a standard distance of the tube to patient of 17 inches (43.1 cm.). In the first series treatments were given twice weekly for eight sessions and were followed by an interval of six weeks, in the second series twice weekly for six sessions, with an interval of six weeks, and in the third series weekly for six sessions.

13. Forestier, J.: Importance of Sacro-Iliac Changes in Early Diagnosis of Ankylosing Spondylarthritis: Marie-Strümpell-Bechterew Disease, Radiology **33**: 389-402 (Sept.) 1939.

ABSTRACT OF DISCUSSION

DR. BERNARD I. COMROE, Philadelphia: At the University of Pennsylvania we have had about the same results that the authors have reported. Roentgen therapy in rheumatoid arthritis of the spine is the best single agent that we have at our disposal. Our method of treatment varies somewhat from theirs. We employ intermediate voltage, using 135 kilovolts. We have divided the spine posteriorly into three areas and have treated each area at the onset on consecutive days. For example, on Monday we treat area A with 100 roentgens, on Tuesday area B with 100 roentgens, on Wednesday area C with 100 roentgens, and on Thursday all three areas with 100 roentgens. The following Monday and Thursday we give 100 roentgens to all three areas; this is repeated the next Monday and Thursday so that each area has received 600 roentgens over a period of several weeks. At this time we wait for a period of ten or twelve weeks before instituting further roentgen therapy. With this dosage we have been able to eliminate practically all untoward reactions. There has been no nausea or vomiting in any of these patients treated only posteriorly and we have had no instances of marked or persistent leukopenia. We have hesitated to treat female patients with roentgen rays because of the dose that seems necessary to obtain results; in women we have used the recognized medical and orthopedic treatment as outlined by Dr. Loring Swaim and others. It has been shown by Griffith and Hodes at the University of Pennsylvania that following roentgen therapy there occurs a marked dilatation of the capillaries, subcapillary plexuses and arterioles under the area treated, which persists not for only a few hours (as occurs with other forms of heat) but for at least several days. We think that this active hyperemia may be part of the answer to the improvement from roentgen therapy in these patients.

DR. CARL E. BADGLEY, Ann Arbor, Mich.: Primarily the treatment has consisted in attempting to relieve these patients during their period of pain until ankylosis sets in, and with the resultant ankylosis relief of pain is the usual rule. Then comes the question of arthroplasties for ankylosed joints, usually the hip joints, which require, if both are involved, an arthroplasty for function. Roentgen therapy may do far more than simply give relief from pain, which is the only conception that the authors have presented today. They have not claimed to cure these patients. They have presented a group of cases treated and observed over a period of a year with substantial maintenance of relief from pain. Not only does roentgen therapy give relief from pain as a temporary measure but it may give relief from pain for some period of time. They have pointed out that calcification of ligamentous structures has continued by roentgen examination with the continuation of the formation of calcification of the ligamentous structures and presumably increasing ankylosis. They have also demonstrated what I have come to regard as an important factor, and that is that the sedimentation rate has diminished. That leads

me to the third point, which has not been mentioned and which I think will be of significance. In our attempts at arthroplasty by the vitalium cup in this group of patients with spondylitis rhizomelica we have had excellent results if bony ankylosis has occurred and if the sedimentation rate is low. In those patients, however, who have not an ankylosis, who do have an elevated sedimentation rate and who do have symptoms of pain in the joint, our results with arthroplasty have not been good. It seems that in addition to the relief from pain and to the improvement of function which they have demonstrated in 50 per cent of their patients they may also put these patients in better condition for further operative treatment of the affected joints.

DR. CHARLEY J. SMYTH, Ann Arbor, Mich.: Dr. Comroe suggested that by his technic he had been able to obviate some of the gastrointestinal symptoms which occur with this method of therapy. In our experience anorexia, nausea, vomiting and sometimes diarrhea were common toxic symptoms, particularly when treatment was directed over the abdomen. Even after the total amount of irradiation was reduced these symptoms were observed. I was glad to hear Dr. Comroe's remarks regarding a possible rationale for roentgen therapy. We have been unable to find any adequate explanation for the way in which roentgen rays produce the changes which we have observed. Forestier has treated 25 patients by injecting radon subcutaneously. He reports excellent results and believes that, if such therapy is sufficiently pursued, complete arrest of the disease can be accomplished. We are convinced that roentgen therapy is a valuable treatment in this disease. Our results are in agreement with most others who have used this method in a large number of cases. Whether the benefit is entirely symptomatic or whether the course of the disease is favorably altered are questions which can be determined only by further investigation.

INDUSTRIAL EXPOSURE TO TOXIC CHEMICALS

A SCHEME FOR ITS MEDICAL CONTROL

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AND
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Modern total warfare in Europe and national defense in the Americas make health and efficiency as important for civilians as for the fighting forces. The vast scale of defense preparations is adding to the difficulty of maintaining this health. Companies hitherto working on a relatively small scale are expanding to fulfil war contracts and are handling materials new to them. Inexperienced workers are being employed. Perhaps of most importance, physicians with little or no experience in industrial medicine and no knowledge of industrial toxicology are suddenly made responsible for the care of thousands of workers.

Few branches of modern industry can avoid the use of chemicals of potentially toxic nature. There is rapidly growing a demand for information on industrial toxicology. There is also an increasing realization that the literature in this field, while detailed and voluminous in records of frank cases of poisoning, holds scant data which can be used at once in a practical program for conservation of health.

It seems pertinent at this time to describe briefly a scheme for medical control of industrial health which has been built up during the last four years and is now used as a routine in large plants in the chemical industry, both for control of known hazards and for detection of new ones. A full description of the development of this method and of the tests to which it has been subjected would require a voluminous report. For the moment, it is thought best merely to outline the procedure followed, with such explanation as is needed to show its value.

From the Haskell Laboratory of Industrial Toxicology.

Satisfactory prevention of injury from exposure to toxic chemicals cannot be based on knowledge of the clinical pathologic changes in cases of actual poisoning. Such prevention can be efficient only if knowledge is available on the first detectable changes in physiology that follow exposure to such concentrations of chemicals as, if exposure were continued, might cause ill health. This type of knowledge becomes of more importance if it is realized that, day by day, new materials of unknown activity are being used. The combined facilities of all toxicology laboratories of the country are not sufficient to investigate quickly all these new potential hazards.

Our experience has, we think, definitely shown that the first effects of exposure to toxic substances, which when absorbed by any route can have systemic (as opposed to purely local) effects, are substantially the same no matter what the chemical structure of the material. On the detection of these early effects we have built up a program of preventive medicine. This scheme is essentially one of medical control, not of chemical or engineering control. We would emphasize this point because there is a growing tendency to rely on air analyses and on so-called safe levels of atmospheric concentrations of gases, vapors, fumes or dusts. This tendency overlooks the fundamental fact that, apart from the economic aspect of loss of valuable material (an aspect which is not of medical concern), the actual concentration of toxic substances in the atmosphere of workrooms is of no importance if the health of the worker is not impaired. Obviously the extent to which workers are affected cannot be made known by studying the air. We are concerned with whether the worker is sick and not whether the air is sick. In very important cases it is not inhalation of contaminated air which caused injury but absorption of materials through the skin from soiled work tools or clothing. In such event, analyses of the air are useless.

We do not wish, however, to imply that analysis of the air is of no value in preventive medicine. It is highly important in determining the mechanical efficiency of operating equipment and ventilating systems. Yet it is useless to develop a complicated system of analysis of the air and at the same time to omit medical control. This brief discussion of the problem will serve to point out the significance of the method of medical observation to be described.

There are three stages in industrial life at which the worker should receive a medical examination: (*a*) on applying for work, (*b*) while working and (*c*) when released from employment or when transferred from one occupation or one type of exposure to another.

Preemployment examinations should be comprehensive, including not only the usual history, physical examination and laboratory studies of blood and urine but also a roentgen study of the chest and, perhaps, an electrocardiogram. Such examinations should be used for selection and never for elimination of workers. Selection of a worker for a given job is necessary. One does not license a blind man to drive an automobile or locomotive. One should not allow a sufferer from claustrophobia to work in confined places such as sewers, nor should one allow a man with tuberculosis to work in a dusty atmosphere, nor one with liver disease

to be exposed to a chemical which can further injure his liver. It is best to grade the hazards in different operations in the plant on a medical basis and to select workers on the same basis. In large plants this may not be difficult, for there are usually jobs involving little hazard which will give employment to those not fit for the hazardous occupations. In smaller plants this is not always the case. There then arises the problem of rehabilitation which, in our opinion, is an important but hitherto neglected duty of medicine in industry.

After the employee is selected for the job, a plan must be set up for following his health during employment. Finally, since all workers do not remain in one job or one plant forever, each should be examined on being transferred to another job or on being released from employment. This transfer or release examination should be as comprehensive as was the preemployment examination. Only by following such a policy can the present confusion attending medical evidence in suits for compensation be avoided.

We are concerned here with the criteria for employment and the scheme for control of health during

Name	Plant number or Age
Occupation	Social Security Number
Date	Temperature Humidity
Pulse	*Additional Notes*
Blood pressure of right arm	Blood pressure score
Blood pressure of left arm	Volume index
Weight	
SYMPTOMS:	
Fatigue	
Headache	
Irritability	
Nausea	
Fulness of stomach	
Loss of appetite	
Gas on stomach	
Dizziness	
Pain in epigastrium	
Pain in precordium	
Pain in arms	
Pain in neck	
Dyspnea at rest	
Dyspnea on slight exertion	
Examiner .....M.D.	

Form of record for periodic examination of workers during exposure to toxic chemicals.

employment. The former must necessarily include such methods of selection as will be used as a basis for the setting up of the control scheme during employment. Both, therefore, depend on the consideration of the first effects of exposure to toxic chemicals. Our experience over the last four years has shown that these first effects consist of a few simple symptoms and certain definite signs, which are the same in exposures of many kinds. The symptoms are: easiness of fatigue, headache, gastroenteric disturbance (nausea, loss of appetite, a feeling of fulness of the stomach, gas on the stomach, pain in the epigastrium), dizziness, precordial pain, pain or tingling in the extremities and dyspnea on slight exertion. Of course, all are not present in all cases. They are, at first, indications of functional disturbance only and not of organic injury. Of these symptoms, easiness of fatigue is probably the most universal and usually the first to appear.

Symptoms are matters of opinion or feeling of a patient. They cannot be expressed in any numerical fashion and, therefore, are not subject to statistical analysis. Moreover, certain labor situations often make it rather difficult to obtain a frank history from a worker, and even if a history is obtained the intensity of the symptoms can in no way be determined, since it can be deduced only from the statement of a worker. That statement depends on many personal characteristics, including veracity. Sometimes the frequency of occurrence of particular symptoms can be analyzed mathematically, but there is always a question as to the degree of frankness of each member of the group under study.

The first signs of exposure to toxic chemicals are definite changes in pulse rate and in blood pressure. Changes in diastolic blood pressure are the most important. Blood pressure can be measured by standard procedure and recorded numerically with a fair degree of accuracy. Such records, therefore, are susceptible of mathematical analysis. For this reason, our scheme is based on blood pressure measurements. This has an advantage which is not obvious at first to those not acquainted with industrial medicine. The efficiency of any scheme for medical control of health in industry depends on the frequency with which the physician can examine each individual worker. But each examination requires that the worker leave his work. Examinations, therefore, must be simple and not time consuming. Industry is concerned with the production of materials and not of medical examination records. Experience shows that an examination which consists of the recording of the few symptoms outlined and of blood pressure readings occupies only about ten to fifteen minutes. It can be, and is being, used as a routine at intervals of one, two or three weeks and, once understood by management and worker, is welcomed by both as giving assurance of protection against ill health from occupational hazards.

The form of record of such special examinations is shown in the accompanying form. The blood pressure should be measured with the worker sitting, according to the recent recommendations of the Committee for Standardization of Blood Pressure Readings of the American Heart Association.[1] For the purpose of our scheme, we find it best to take measurements on both arms as well as to record the two levels of diastolic blood pressure. We suggest this because much interesting early information can be obtained from the occurrence of abnormal differences between the measurements on the two arms and between the two levels of diastolic blood pressure on either or both arms. When the sphygmomanometer cuff is changed from one arm to the other, the worker being examined must not be allowed to move rapidly in assuming a comfortable position. He need not stand up but need only rotate his chair. A swivel chair is very useful here.

Blood pressure measurements can be followed in several ways. The simplest is by setting up arbitrary levels of normal and abnormal to be used in both preemployment and special examinations. There is much controversy as to what is to be accepted as normal or abnormal blood pressure. We list here the levels which we have found useful and on which we base our program. The following we consider abnormal:

Systolic blood pressure, 150 mm. or higher, or below 100 mm.
Diastolic blood pressure, 90 mm. or higher, or below 65 mm.
Pulse pressure below 30 mm.
Pulse rate 90 or higher a minute; below 60 a minute.

1. Standard Method for Taking and Recording Blood Pressure Readings by the Committee for the Standardization of Blood Pressure Readings of the American Heart Association and the Committee for the Standardization of Blood Pressure Readings of the Cardiac Society of Great Britain and Ireland, J. A. M. A. **113**: 294-297 (July 22) 1939.

The difference between systolic pressures of the two arms should not be greater than 20 mm.

The difference between diastolic pressures of the two arms should not be greater than 10 mm.

Difference between the two levels of recording of diastolic blood pressure on either or both arms should not be greater than 10 mm.

Despite arguments to the contrary, we find that in a group of workers selected for employment by a medical examination, which includes the foregoing blood pressure criteria, the blood pressure of individuals is stable so long as they are not affected by disease or exposure to toxic chemicals. In such groups, it is our experience that chance (that is, unexplainable) variations in blood pressure beyond the normal limits given do not occur to the extent of more than 6 per cent of a large number of examinations. We shall later describe the use of this yardstick of 6 per cent, taking into account the effect of variations in the number of examination records available for study. Our experience is now based on a study of more than one hundred thousand blood pressure records collected during the last four years on more than 2,000 men exposed to a variety of chemical hazards. Each month this experience is being increased by more than two thousand examinations.

USE OF BLOOD PRESSURE MEASUREMENTS TO STUDY EXPOSURE TO TOXIC CHEMICALS

The simplest method of following the medical status of exposed workers is to examine them at frequent intervals (one week, two weeks or three weeks), and to count the number of examinations in which there occur abnormal blood pressure measurements. The total number of examinations, and the number showing abnormality, are then compared with the 6 per cent yardstick. This comparison is made easy by figure 1. This chart shows, on the horizontal base line, the number of examinations in the group under study. On the vertical line to the left is the number of abnormal examinations in this group. The chart is divided into two large areas. The upper one is for use with groups of examinations totaling from sixty to three hundred and sixty; the lower, groups of examinations from one to sixty. The left hand column, giving the number of abnormal examinations, applies to both parts of the chart. The curved lines divide the chart into four areas in each of the larger sections, and these areas are labeled *N*, 1, 2 and 3 respectively.

These areas correspond to different degrees of probability that the number of abnormal examinations in the group under study is not greater than would be expected in a sample of the same size taken at random from the large standard normal population, in which there are no more than 6 per cent abnormal examinations.

Area *N* includes groups which are not significantly different from the normal standard. Areas 1, 2 and 3 include groups which are significantly different from the normal standard, and the significance increases from 1 to 3. The higher the index of the area, the more abnormal the group under study. The upper limits of *N* correspond to the probability of 1 in 20 that the group under study contains no more abnormal examinations than a sample of the same size from the standard population. These odds are not significant. The upper limits of the other areas are: area 1, 1 in 1,000; area 2, 1 in 100,000; range of area 3, 1 in 100,000 to 1 in infinity. These odds are significant.

When blood pressure measurements are used in following effects of exposure to chemicals, a certain number of facts immediately becomes obvious. These are:

(*a*) High systolic blood pressure is not an early result of exposure to toxic chemicals. It appears only after months or years of an exposure which has already produced significant changes in diastolic pressure. High systolic pressure, therefore, is not important in following the immediate trend of effects of exposure, with one exception: If a man has been employed already having a high systolic blood pressure (that is, if he has been employed by a method not using the criteria of normal and abnormal pressure levels set out), in his case a fall in systolic blood pressure toward or to or below normal levels can be considered a sign of disease or of action of a toxic chemical.

(*b*) Low concentrations of toxic chemicals tend to produce an increase in diastolic blood pressure and a fall in pulse pressure. Both may reach abnormal levels. A diastolic blood pressure of 90 mm. or more, if long maintained, may be followed by an increase in systolic blood pressure to abnormal levels and hence by the production of a definite systolic and diastolic hypertension.

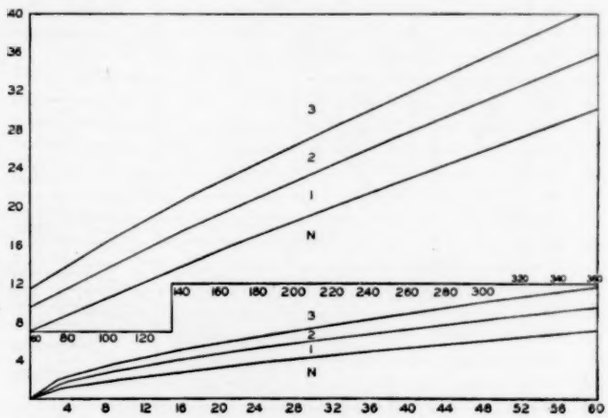

Fig. 1.—Chart for determination of normality or abnormality of a group of examinations by comparison, statistically, with a standard group of normals. (See text for way to use chart.)

(*c*) Higher concentrations of toxic chemicals cause a decrease in systolic or diastolic blood pressure, or both, and eventually both systolic and diastolic, as well as pulse pressure, may arrive at abnormally low levels.

(*d*) In a progressive exposure, which is not so acute and intense as to cause an immediate fall in blood pressure, the order of appearance of abnormal pressure is, in general: high diastolic blood pressure, low pulse pressure, low systolic blood pressure and low diastolic blood pressure.

(*e*) Abnormal differences between systolic or diastolic blood pressures of the two arms, or between the two levels of recording of diastolic blood pressure on either or both arms, may appear before any serious abnormality of individual readings becomes frequent. The exact cause of these phenomena is not yet known.

(*f*) Changes in pulse rate occur early in exposure but are of significance only when related to diastolic and pulse pressure. The nature of this significance will be mentioned later.

The frequency of occurrence of abnormal blood pressure readings, and especially of abnormal diastolic readings, can be used:

(*a*) To follow the effects of exposure on individuals, or on groups of workers;

(*b*) To compare the degree of exposure in different occupations in the same plant, even when those occupations involve exposure to different chemicals, and

(*c*) To determine the efficiency of physical means of protection of workers and to follow the effects of changes in the means of protection.

SCORING BLOOD PRESSURE READINGS

The inherent defect in the procedure of simply counting the frequency of occurrence of abnormal and normal blood pressure readings is that it fails to indicate the trend to or from abnormal levels in any particular individual record. To eliminate this defect, we have devised a method of scoring, which is based on the mathematics of probability. In a large number of blood pressure measurements it is possible to calculate an average value or a mean. The remaining measurements will then distribute themselves at different distances from this mean according to a symmetric curve of probability, the normal gaussian curve. The mathematics of this curve is well known. We have used this distribution to set up a scoring system which gives some index of the probability of occurrence of blood pressure readings at varying distances from an accepted mean. The mean used for diastolic pressure (sitting) is 79 mm. and for pulse pressure 44 mm. A diastolic or pulse pressure reading of 79 or 44 respectively would be given a score of 1. Readings above or below these means are given scores less than 1. The scores decrease with increase of the difference between the measured reading and the mean value of 79 or 44. The scores decrease in the same way on both sides of the mean, so that a diastolic blood pressure of, say, 85 mm. would have the same score as one of 73 mm., and a pulse pressure of 38 mm. would have the same score as one of 50 mm. In actual practice, we prefer to use a system which takes into account diastolic and pulse pressure scores simultaneously. The final score is actually the product of the individual diastolic pressure and pulse pressure scores. This is based on the fact that the probability of simultaneous occurrence of two events is the product of the probabilities of occurrence of each event individually. Since the mathematical calculation of the score could be tedious, we have drawn up the graph (fig. 2) from which, using the pulse pressure and diastolic pressure readings, the score can be read at once.

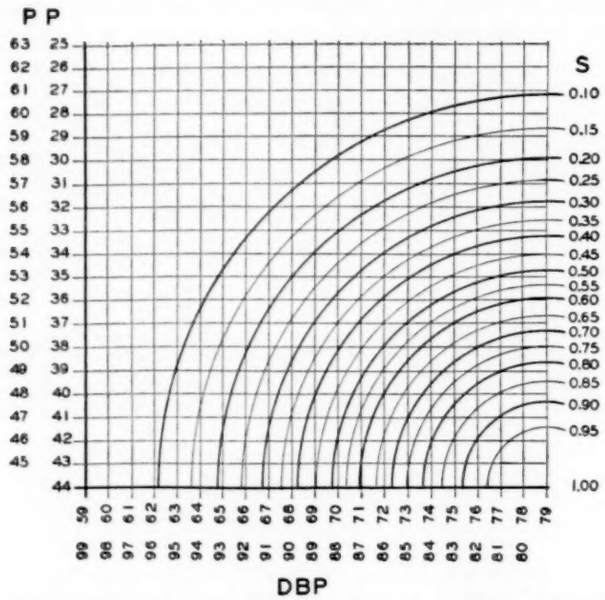

Fig. 2.—Chart for calculation of score for diastolic and pulse pressure readings. (See text for way to use chart.)

On the horizontal axis of this chart there are entered diastolic blood pressure readings. On the vertical axis are pulse pressure readings. Across the chart are quadrants of circles, each of which at its right-hand end carries a figure, which varies between 1 and 0.1. Since the scores are based on the distances of pulse pressure readings and diastolic blood pressure readings from the mean values and not on whether the actual readings are higher or lower than the mean, it will be found that a diastolic blood pressure of 85 appears at the same point on the horizontal axis as does a diastolic blood pressure of 73, and a pulse pressure of 50 appears at the same place on the vertical axis as does a pulse pressure of 38. To use this chart, the diastolic blood pressure should be read on the horizontal axis and traced vertically until it comes into line with the pulse pressure as read on the vertical axis, and then one reads the score by finding the arc of the circle which is nearest to the point of intersection of pulse pressure and diastolic pressure readings. As a practical procedure, we usually calculate the score from the average of the systolic and diastolic readings of the two arms. When the chemical exposure is such as to lead to circulatory collapse (for example, exposure to nitrites), we use the lower diastolic pressure reading; that is, the pressure read at the disappearance of sound. This makes the method more sensitive. When circulatory collapse is not a probable result of the chemical exposure, we use the diastolic pressure measured at the change of sound.

In using this scoring system, we consider that a score of value 1 to 0.2 indicates a normal relationship between diastolic and pulse pressures, and a normal situation with regard to the mean values determined from a large population. We consider a reading above 0.1 but lower than 0.2 to be of doubtful normality and a reading of 0.1 or lower to be definitely abnormal. In studying groups of workers in a plant, we count the number of scores in their examinations which have a value of 0.1 or less and then classify the group as a whole according to figure 1; that is, we compare it with a yardstick of 6 per cent abnormalities.

The scheme for medical study then becomes as follows: A program of frequent examination of workers is set up by the simple form of examination outlined. (It is best not to set up such a rigid program that a worker is always examined on the same day of the week. We mention this because in certain hazards, after the week end of rest, a man's condition on Monday or Tuesday is not the same as it might be on Wednesday or Thursday, and only by staggering examinations can one, in the course of time, get a complete picture of the situation actually developing.) After the blood pressure measurements have been recorded on each worker as found at a given examination, the blood pressure score is calculated. If it is 0.1 or below, we proceed as follows:

Find whether other men working at the same part of the plant, in the same occupation, show such an abnormal score, either on the same day or on a day or two before. If other examinations give abnormal results, then the immediate probability is that the condition is due to a chemical exposure, and the physician should inquire as to the efficiency of protective

equipment, the load of production on the men or the manner in which they are doing their work. If 1 or 2 men alone in a group show an abnormal score on a given day or over a period of one or two days, then one should ask "Are these men in a different job from the others in this group?" or "Is their manner of doing their job such as to give them more exposure than the other members of the group?" or finally, "Are there particular personal habits or personal problems of these two men which make them abnormal when others are normal?"

A single abnormal examination should be taken as an indication that it is wise to reexamine that worker within a few days to decide on his status. If within two or three weeks three or four examinations still show an abnormal score, one must consider the action to be taken in the particular case. These abnormal scores are warnings of functional disturbance due to disease or exposure to toxic chemicals. If the warning is unheeded, organic disturbance may develop. If the warning is heeded, a change in occupation or improved conditions of work, improved diet, more rest after working hours and so forth can, in the majority of cases, remove the functional disturbance and restore the man to complete normality.

DETECTION OF PENDING CIRCULATORY COLLAPSE

Acute exposure to toxic chemicals sufficient to cause a fall in diastolic and systolic blood pressures may lead to a condition verging on circulatory collapse. If a worker in such a state continues to work, collapse may actually occur. It is due, in most instances, to a failure of the circulation to overcome the effects of gravity, so that insufficient blood is returned to the right side of the heart. If this condition is detected immediately, rest in the supine position, with the head lower than the legs, can restore normal circulation. If it is not detected, and the man falls, he may automatically reach the horizontal position and so restore circulation to normal; but, should he fall in a cramped position, sudden death may occur.

It is important to be able to detect such impending collapse and to record the efficiency of measures used in overcoming it. For a long while we made use of the "Crampton index," devised by C. Ward Crampton,[2] but this index is based only on pulse rate and systolic blood pressure. Moreover, it requires the worker to be lying quietly for at least five minutes and then to be standing for five minutes. After each interval, pulse rate and blood pressure measurements are taken. This may not seem much time, but when each examination in a large program of examinations is extended by ten or fifteen minutes the whole program is liable to be condemned because of the accumulated time lost from work. Recently we have developed tests based on the observation of Fürst and Soetbeer[3] that the ratio of pulse pressure to the sum of diastolic blood pressure plus one third of the pulse pressure gives a satisfactory index of the filling volume of the heart. We have studied this index in relation to our probability system of scoring and have established an index of 0.3 as a lower limit of normal. We have also taken into consideration the fact that, while the stroke volume of the heart may not be adequate, yet in such a circumstance a normal person can compensate by a reflex increase of the heart rate. We have calculated that a suitable lower limit of value of the product of volume index × pulse rate is 23, and that values below 23 indicate impending circulatory collapse.

The routine use of this volume index and its relationship to pulse rate is made easy by figure 3. This consists of three graduated lines. The vertical line on the left marked *S* is systolic blood pressure and is graduated to 2 mm. The vertical line marked *D* is diastolic blood pressure, graduated in the same way. The sloping line marked *V* is the index of filling volume. The table on the right gives the minimal pulse rate,

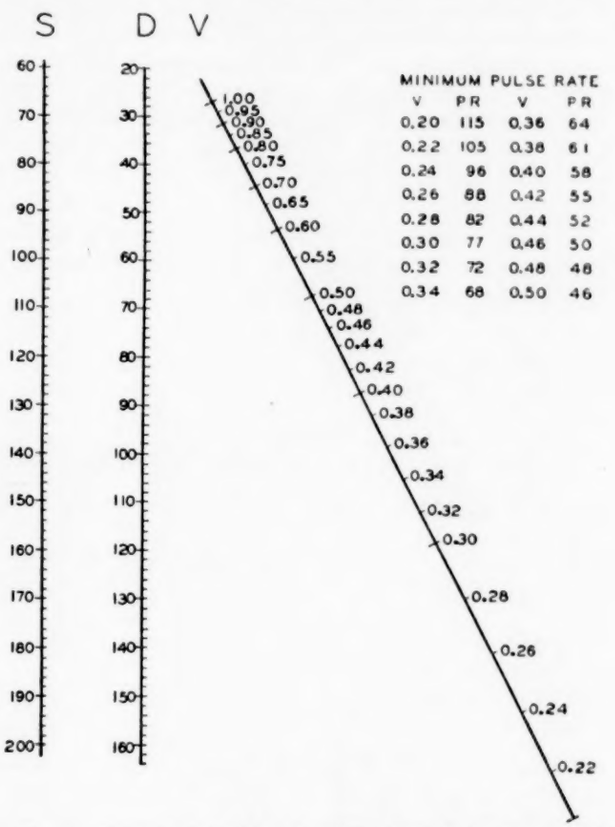

Fig. 3.—Chart for calculation of filling volume index from systolic and diastolic blood pressures. (See text for way to use chart.)

which, when associated with the lower values of the filling volume, is necessary to produce circulatory compensation.

To use this chart, simply stretch a piece of string or lay a transparent ruler across the chart in such a way that it cuts the reading of systolic and diastolic blood pressures and extends over to the volume index line. Read off the volume index and look at the table of minimal pulse rates to see whether or not the man's actual pulse rate is below or above that necessary for proper compensation. To obtain the greatest sensitivity of this method, we use the diastolic pressure reading obtained at the change of sound, since this gives the lower pulse pressure value. As in the case of the probability scoring system, we calculate the filling volume index from the average of the systolic and diastolic pressures of the two arms. This chart is extremely valuable

2. Crampton, C. Ward: The Gravity Resisting Ability of the Circulation; Its Measurement and Significance (Blood Ptosis), Am. J. M. Sc. **160**: 721 (Nov.) 1920.

3. Fürst, Theobald, and Soetbeer, Franz: Experimentelle Untersuchungen über die Beziehungen zwischen Füllung und Druck in der Aorta, Deutsches Arch. f. klin. Med. **90**: 190-208, 1907.

in detecting impending circulatory collapse and in following the effect of methods of combating this collapse, whether the condition is due to heat, to inhalation of toxic chemicals or to air hunger produced by flying at high altitudes.

COMMENT

We have outlined a scheme which we have found practical and useful in industrial preventive medicine in the chemical industry. It would require too much space to detail all the possible ways in which this scheme can be used. Each one of the procedures suggested has been reduced to a simple chart or form in which it can be applied without unnecessary arithmetic or higher mathematics. The degree of benefit gained by the use of these charts depends on the frequency of examination and the earnestness with which the individual physician attends to his business of prevention. If he cares more for the diagnosis of poisonings than for prevention, the methods are of little value, and, to be quite frank, neither is he of great value as an industrial physician. In industrial medicine we are not interested in producing sick or dead men. Our job is to keep them well.

The methods outlined have been used in detection or in routine study of results of exposure to chemicals of the following groups or structure:

- Lead
- Carbon monoxide
- Hydrogen sulfide
- Sulfur dioxide
- Hydrocarbons (toluene, diphenyl)
- Chlorinated hydrocarbons (carbon tetrachloride, chloroprene and phosgene)
- Alcohols (methyl alcohol)
- Ketones (acetone)
- Esters (methyl, butyl, ethyl acetate and the like)
- Carbon bisulfide
- Aromatic and aliphatic nitro compounds and nitric acid esters
- Aromatic amines
- Aromatic nitriles
- Diphenyl oxide

So long as we are interested in the earliest signs of exposure to any one of this varied list of compounds, we find the procedure applicable. We have also used the foregoing principles in following the effects of toxic chemicals on experimental animals.

Lest it be imagined that this method of approach is of use only in industrial toxicology and medicine, we would point out that infections are really chemical poisoning. Except in the case of the gas bacillus group, bacteria and infesting micro-organisms do not cause disease merely by their local destructive action. Even in the case of the gas bacillus group, the most important action clinically is the production of a very virulent toxin. Further, in ordinary medical practice, many therapeutic substances are used whose toxic action can be followed by this procedure; for example, the drugs of the sulfanilamide group, acetanilid and its derivatives. Finally, the same procedure would probably be of use in aviation medicine, since deprivation of oxygen, either at high altitudes or in poisoning with carbon monoxide, will cause just such changes in circulation as our scheme is devised to detect.

SURGICAL RESECTION IN NON-SPECIFIC ILEOCOLITIS

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Two terms should be defined at the outset. The first is "nonspecific," by which is meant "of unknown or undetermined origin." The second is "right portion of the colon," by which is meant "the cecum, ascending colon and hepatic flexure."

This study of surgical resection for nonspecific ileocolitis was prompted by a recent review of malignant lesions of the right portion of the colon. The present review is based on the records of 100 patients for whom the terminal portion of the ileum and the right portion of the colon were resected for nonspecific inflammatory disease. Resection in these 100 cases was performed by eleven different surgeons.

In an attempt to evaluate the results of possible surgical procedures, the cases were classified into the divisions of "stage operation" suggested by Lovelace and one of us (Mayo). This has been modified as in table 1.

AGE AND SEX

Of the 100 patients, 54 were men and 46 were women. The average age was 32.5 years. Thirty-two patients were found to fall in the group of operations in one stage, 64 in the group of operations in two stages and only 4 in the group of operations in multiple stages. The groups were somewhat similar as to sex and age, as shown in table 2.

SYMPTOMS

Symptoms had been present for an average of two and sixty-three one hundredths years, with a range of one week to eighteen years. The outstanding symptom was diarrhea. Some patients first had noticed a "lump in the right side." Sixteen patients knew they had a mass before they registered at the clinic. In 22 cases a mass was first reported here. As has been stated rather consistently in most papers dealing with this topic, the appendix had been removed recently in certain cases. Twenty patients had undergone appendectomy within one year of admission. In several instances the home physician had stated that "a disease condition" was detected in the ileocecal coil at the time of appendectomy.

The persistent discharge of serum, pus or fecal material from an appendectomy wound prompted many patients to request surgical intervention.

HEMATOLOGY

In contrast to the anemia reported in papers on malignant disease of the right portion of the colon, marked anemia was not a feature of this group of patients. Prolonged diarrhea with attendant chronic dehydration appeared to have produced hemoconcentration, giving relatively high blood counts, out of proportion to the obvious condition of the patients (table 3).

ROENTGENOGRAPHIC REPORTS

The roentgenographic reports in the majority of instances were highly accurate. In most instances the diagnosis was established clearly, and the extent of the

From the Division of Surgery, Mayo Clinic.
Read before the Section on Gastro-Enterology and Proctology at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 5, 1941.

disease process was well defined. Two or more attempts occasionally were necessary, and roentgenologic examination after a barium sulfate meal was employed as indicated. Some type of roentgenogram of the bowel was made in all but 9 cases. In 5 cases a report was rendered of "negative colon and terminal ileum"; in 2 cases the report was "carcinoma of the cecum." In these 7 cases the diagnosis was fully established at the time of operation. It must be remembered here that in certain of the "negative" cases the roentgenologist had suggested a roentgenologic examination after a barium meal but the clinician had deemed it superfluous in the face of definite surgical indications.

INTRAPERITONEAL VACCINATION

The true value of intraperitoneal vaccination remains difficult to determine. Some of the surgeons considered the vaccine unnecessary because of the inflammatory nature of the disease. In other cases the effect of a preexisting fistula was considered to be just as inhibitory to subsequent development of peritonitis as the injection of the vaccine might be. Antiperitonitis vaccine was employed in 34 of the cases, 24 of these being in the two stage group. In several of these the vaccine was not given until just before the second stage. This feature is in contrast to the beliefs of those surgeons who hold that the performance of the ileocolostomy already has conferred a degree of immunity.

TABLE 1.—*Classification of Surgical Resection for Nonspecific Ileocolitis*

1. One stage
   Resection with primary ileocolostomy performed as
   a. Side to side anastomosis
   b. End to side anastomosis
   c. End to end anastomosis
2. Two stage
   First stage: Ileocolostomy performed as end to side or side to side anastomosis (with or without transection of ileum between the site of the ileocolostomy and the ileocecal valve)
   Second stage: Resection, performed with
   a. Closure of divided ends of ileum and colon (in presence of a side to side ileocolostomy performed in first stage of operation)
   b. End to end anastomosis of divided ends of ileum and colon (in presence of a side to side ileocolostomy performed in first stage)
   c. Closure of the end of the colon if an end to side ileocolostomy has been performed in the first stage
3. Multiple stage
   First, exteriorization of the lesion, with or without immediate resection
   Later, removal of the lesion (if not done at first operation) and application of crushing clamps to the spur left by the colostomy. The application of clamps is repeated as many times as may be indicated
   Final stage: Closure of the colonic stoma

The remainder of the preoperative preparation was closely similar to that for the series of malignant neoplasms of the right portion of the colon. In many cases longer hospitalization was the rule before operation. This appeared necessary to restore fluid, chemical and nutritional balance and also to afford an adequate observation period to rule out all other possible causes of fever. The only patients who were subjected to operation in less than three days of hospitalization were those for whom the correct diagnosis had not been established.

ANALYSIS OF SURGICAL PROCEDURES

Employing the classification mentioned previously, we scrutinized the various methods of attack in an attempt to evaluate them on the basis of results (tables 4 and 5).

Resection in One Stage.—There were 32 cases in which resection in one stage was performed. The results indicate that when nonspecific inflammatory disease exists in the terminal portion of the ileum and the right portion of the colon the risk is greater when the disease is attacked by resection in one stage than when it is attacked by procedures in two or more stages. This is of special interest in view of the fact that, on an average, as indicated by a recent review, in the presence of malignant lesions of the right portion of the colon the procedure in one stage had certain advantages over procedures in multiple stages from the standpoint both of mortality and of prognosis. When anastomosis and resection are performed in one stage, a reasonable additional safety measure is accomplished by leaving the transverse colon out as a retrograde colonic stoma proximal to the anastomosis. This may be closed later if and when indicated by the general condition of the patient.

TABLE 2.—*Surgical Resection in Nonspecific Ileocolitis*

Type of Resection	Male	Female	Average Age, Years
One stage	18	14	37
Two stage	35	29	31
Multiple stage	1	3	32

TABLE 3.—*Surgical Resection in Nonspecific Ileocolitis*

	Hemoglobin, Gm.			Erythrocytes, Millions		
	Less Than 7	7 to 11, Inclusive	12 and More	Less Than 3.5	3.5 to 4.4	4.5 and More
Cases *	5	39	55	5	40	39
	Average: 13			Average: 4.3		

* Includes only those cases in which values were obtainable.

Resection in Two Stages.—Sixty-four patients underwent resection in two stages. There were many factors which influenced the wait between the ileocolostomy and subsequent resection, so that the interval varied from one month to eleven years. This includes those cases in which the anastomosis was performed elsewhere and the patient was sent to the Mayo Clinic for resec-

TABLE 4.—*Surgical Resection in Nonspecific Ileocolitis: One Stage Resection (Thirty-Two Cases)*

Type of Anastomosis	Cases	Witzel * Enterostomy, Cases	Average Postoperative Hospital Days	Deaths in Hospital	Causes of Death
End to end	4 (13%)	1	37†	1	Peritonitis
Side to side	18 (56%)	13	22	4	Peritonitis 2, embolism 1, superior mesenteric thrombosis 1
End to side	9 (28%)	2	27	2	Peritonitis
Not specified	1 (3%)	..	34	..	
Total or average	32	16 (50%)	26	7 (Mortality rate 22%)	

* Whether or not to use the Witzel temporary enterostomy depends on the view of the individual surgeon. From the present review, no argument can be derived either to promote or to discourage its use.

† In two of these cases the ileum had become attached to neighboring organs (with perforation) and more than usual amount of surgical work was required, so that the results in figures are not quite representative.

tion. The average interval between stages was fourteen and four-tenths months.

Resection in Multiple Stages.—Only 4 patients underwent resection in multiple stages. The average stay in the hospital was fifty-nine days. There was one death in this group, caused by general peritonitis.

TABLE 5.—*Surgical Resection in Nonspecific Ileocolitis: Two Stage Resection (Sixty-Four Cases)*

Type of Anastomosis	Cases	Witzel Enterostomy, Cases	Average Postoperative Hospital Days	Deaths in Hospital	Causes of Death
Side to side (ileum not divided)	39 (61%)	7*	37	2	Peritonitis 1, "general sepsis" 1
Side to side (ileum divided)	17 (26%)	1*	33	0	
End to side	8 (13%)	0	37	0	
Total	64	8 (12%)	36	2 (3% mortality rate)	

* All Witzel enterostomies but one were performed at second stage. Assumption: sudden strain about to be placed on existing anastomosis required more safety valve factor; also handling of intestine, freeing of adhesions and the like suggested that further precautions were needed.

Pathologists' Reports.—The diagnoses rendered by the pathologist are interesting from the standpoint of variation. Numerous pathologists gave the reports, and their variation was greatest prior to 1932 (table 6).

PROGNOSIS

Of 32 patients operated on by the one stage method, 7 died. If one wishes to compute this on a percentage basis, the mortality rate is 21.9 per cent. There are too few cases in any one type of resection in one stage from which to draw any conclusions.

Of the 25 patients who were dismissed to their homes, 24 were followed one to five years. Thirteen of the patients are classified here as "cured" and 7 as improved; 2 had a recurrence, 1 of whom died in the hospital, and 2 patients had died at home.

In the group of cases in which operation was performed in two stages, of 62 patients who were dismissed to their homes, 57 were followed from one to five years. Twenty-six are classified as "cured," 19 as improved, 9 as not showing any improvement or being worse, and 3 as having died. Two of these patients died two years after operation and 1 nine months after operation.

TABLE 6.—*Pathologic Diagnosis of Resected Specimens in Nonspecific Ileocolitis*

Type of Resection	Terminal Ileitis	Ileitis and Colitis	Nonspecific Inflammatory Condition	Granuloma
One stage, 32 cases	12 (38%)	17 (53%)	1 (3%)	2 (6%)
Two stage, 64 cases	29 (45%)	23 (36%)	6 (9%)	6 (9%)
Multiple stage, 4 cases	1 (25%)	2 (50%)	1 (25%)	
Total	42	42	8	8

The follow-up disclosed that the longer the patient survived after resection, whether it had been performed in one stage or more stages, the better the subjective and objective results appeared to be.

ABSTRACT OF DISCUSSION

DR. MAX THOREK, Chicago: Regional ileitis was first reported before the Royal College of Physicians of London in 1806 by Combe and Saunders. Crohn and his associates rediscovered it in 1932. Ileojejunitis, described by Crohn and Yunich, differs clinically and roentgenologically from the terminal variety. It affects segments of bowel higher up. It is less frequent than terminal ileitis (one in ten). It is an ulcerative process of specific inflammatory type in which all the components of the intestinal wall participate, particularly the submucosa. Right-sided (regional) colitis was first described by Bargen. It is not difficult to recognize clinically or radiographically. Medical treatment is rarely successful. It may appear as a universal colitis, affecting all of the colon and rectum, or it may start at one point and extend in either direction. In the differential diagnosis, deficiency diseases and faulty fat metabolism come under consideration. Roentgen ray images are characteristic narrowed areas alternating with "skip area" dilatations. The "string sign" is most usually proximal to the ileocecal valve. Spontaneous cure is rather frequent; hence surgical intervention in the acute stages is contraindicated. Where the disease is truly regional, wide resection of the affected bowel in one stage is proper procedure. When the greatest part of the small intestine is more or less involved, surgical treatment is illogical. There is no specific treatment. Chemotherapy and roentgen therapy proved disappointing. Berg described an operation for right-sided ulcerative colitis which consists of multiple stage operations putting the diseased colon completely at rest. It is an ileosigmoidotomy which permits later, if deemed advisable, a colectomy; it obviates operating in the presence of a discharging ileostomy wound. The operation seems well tolerated and has yielded gratifying results.

DR. BURRILL B. CROHN, New York: I note again in Drs. Mayo and Judd's paper that the trend of surgical opinion in ileitis is toward a two stage operation; that this procedure seems to show a lower mortality and apparently as good a clinical result over a long period of follow-up. Four weeks ago a group of surgeons at Mount Sinai Hospital presented a very favorable series of cases; Dr. Colp reported 43 successive two stage shortcircuiting operations for regional ileitis without a death, which is far superior to any of the earlier series of primary resections. The two stage operation comprises an anastomosis between the ileum and the transverse colon; it must definitely be understood that the ileum must be transected, because if the ileum is not transected the process will spread in an oral direction and the disease extend itself. That is a primary principle of any shortcircuiting operation. I noticed again in the authors' series of cases the same question Dr. Philip Brown was asked in Atlantic City: "In what percentage of the cases did you transect the ileum?" While in a high percentage of cases the ileum was transected, in the experience of Drs. Mayo and Judd it was not a universal procedure. That is important. Is the two stage operation always necessary? Definitely not. In the second stage of the procedure, performed after a long period, it was not unusual to find the original disease so well healed and scarred and inactive that we realized the futility of putting the patient through a second stage. If a first stage has been satisfactory and the patient's condition is excellent, to proceed further seems unnecessary. Several such patients have remained in excellent health with the omission of any second stage procedure. I should like to urge this view for serious consideration. There is no point in performing an unnecessary two stage operation if the condition of the patient after the first stage is so satisfactory, if the gain in weight and improvement of hemoglobin is so satisfactory as to show that the patient is undergoing a perfect recovery. A second stage procedure is indicated if fistulation persists, if fever is elevated, if the hemoglobin recedes and if there is continuous loss of weight.

A STUDY OF TUBERCULOSIS AMONG STUDENTS OF NURSING

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A program for the early detection of pulmonary tuberculosis among students of nursing was instituted at the Philadelphia General Hospital in 1935. The present report deals chiefly with information which was obtained concerning the epidemiology of tuberculosis among students of nursing in a large general hospital.

The intracutaneous tuberculin test and roentgen examination were given to each student on admission to the training school. The students who failed to react to tuberculin on admission were retested every four months until a positive reaction was observed. Fluoroscopic examination of all positive reactors was made at four month intervals and roentgen examination was made if a lesion was suspected or demonstrated by use of the fluoroscope. In recent years it has proved more satisfactory to examine all students by means of the fluoroscope because the number whose reactions remained negative to tuberculin was small. In addition, film examination was made whenever respiratory symptoms, fatigue or loss of weight suggested the possibility of clinical tuberculosis, and a film examination of all students was made at the end of training. Periodic examinations were given only during the three years of the training course, but in the case of students who remained at the hospital after graduation as staff nurses the interval of observation was as long as five and one-half years.

The students included in this report comprise 643 white females entering the training school from September 1935 to September 1939. Slightly more than a third of the students were from rural districts of less than 2,500 population and an equal number were from cities of more than 100,000 population. The remaining students were from small towns and suburban communities. A fourth of the entire group were from Philadelphia. More than 90 per cent of the students were aged 17 to 21 years at the beginning of observation; the mean age was 19.8 years. A certificate of good health from a physician was required of all applicants for admission.

During the first six months of training a major portion of the students' time was devoted to work in the classroom and less than fifteen hours weekly was spent in supervised practice in the medical and surgical wards. During this preclinical period no time was spent in the tuberculosis department. In the remaining two and one-half years of the training course, the greater part of the students' time was devoted to nursing care of patients. Each student was assigned to the tuberculosis department for a period of one month. Exposure to tuberculous infection was not limited to this period, however, for not infrequently tuberculous patients are admitted to the general medical and surgical wards before the diagnosis which results in transfer to the tuberculosis department is established.

This study was aided by a grant from the Pennsylvania Department of Health, John J. Shaw, M.D., director.

From the Henry Phipps Institute of the University of Pennsylvania and the Department of Tuberculosis and the Nurses' Infirmary of the Philadelphia General Hospital.

Read before the Section on Preventive and Industrial Medicine and Public Health at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 4, 1941.

RESULTS OF TUBERCULIN TEST

On admission, a reaction to the first dose (0.00002 mg. of purified protein derivative of tuberculin) was found in 183, or 28.5 per cent, of the 643 students admitted, and a reaction to the second dose (0.005 mg. of purified protein derivative) in exactly the same number; the total number of reactors was 366, or 57 per cent. The negative reactors (43 per cent) were retested at four month intervals until a positive reaction was observed. The development of infection was extremely rapid: A positive reaction developed in 48 per cent of the negative reactors at the end of four months. At the end of the first year 85.9 per cent of those originally negative had given positive reactions, at the end of the second year 95.3 per cent and at the end of the third year 100 per cent. The rapid rate of infection indicates that exposure to tubercle bacilli was frequent. The diminishing increment of infection in the latter years of training, despite presumably even heavier exposure in the tuberculosis department, suggests that individual susceptibility may be a factor in determining the development of allergy. In 3 persons the reaction to repeated tests was negative, becoming positive only on the tenth test at the end of three years. The persistence of a negative reaction in these students, after the majority of other students had long been infected, is a striking phenomenon.

Tuberculosis Attack Rate Among Nursing Students

Reaction to Purified Protein Derivative of Tuberculin on Admission	Number of Students	Number Developing Tuberculosis	Observation Years	Attack Rate per Hundred Observation Years
Negative.....	277	34 (12.3%)	625.0	5.43
Positive to 0.005 mg....	183	23 (12.6%)	379.2	6.05
Positive to 0.00002 mg..	177*	11 (6.2%)	408.2	2.70
Total positive.....	360	34 (9.4%)	787.4	4.32
Total at risk.....	637*	68 (10.7%)	1,412.4	4.81

* Six students reacting to 0.00002 mg. of purified protein derivative had minimal tuberculosis on their original film examination and have been excluded from consideration in this table.

RESULTS OF ROENTGENOLOGIC EXAMINATION ON ADMISSION

Unhealed pulmonary tuberculosis was found on admission in 6 students (0.9 per cent). In each instance, the lesion was minimal in extent, and each of the students reacted to the first dose of tuberculin (0.00002 mg. of purified protein derivative).

Calcified foci, typical of healed childhood type tuberculous lesions, were observed in 59 students on admission. In each instance the diagnosis was confirmed by repeated fluoroscopic and roentgen examinations. Calcifications were observed in 39, or 10.6 per cent, of the 366 students who were tuberculin positive on admission, while similar lesions occurred in 20, or 7.2 per cent, of the 277 students who were tuberculin negative.

DEVELOPMENT OF TUBERCULOSIS

Excluding from further consideration the 6 students who had pulmonary lesions on admission, there were 637 students who may be considered to have undergone the risk of having tuberculosis develop.

Pulmonary infiltrations roentgenologically typical of tuberculosis were observed to develop in 62 (9.7 per cent). Since these 637 students at risk had been observed for a total of one thousand, four hundred and

twelve and four-tenths years, this represents an annual attack rate of 4.8 per cent. Confirmation of diagnosis by demonstration of tubercle bacilli in the sputum was possible in only a few instances, since in students with progressive disease treatment was instituted as a rule before clinical symptoms appeared. Examination of gastric washings was not feasible. The roentgenologic diagnosis, made according to generally accepted criteria, was confirmed in every instance by serial film examinations.

Pleurisy with effusion developed in 10 students. One had an asymptomatic pulmonary infiltration on admission. The pleurisy developed twenty-one months later. A pulmonary infiltration developed in another nurse four and four-tenths years after admission and massive pleurisy with effusion a year later. The remaining 8 students with pleurisy had no prior demonstrable tuberculous lesion; in one instance an infiltration appeared simultaneously and in another infiltration appeared six months after the pleurisy, while in the other 6 students, observed subsequently for an average

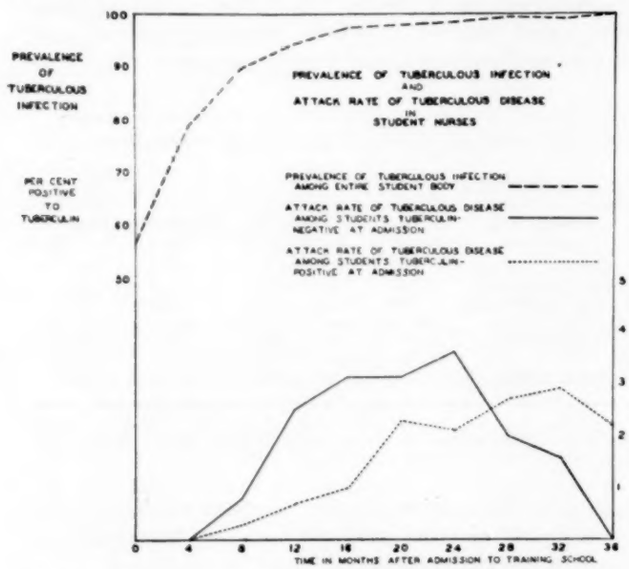

Fig. 1.—Prevalence of tuberculous infection, showing percentage of nurses positive to tuberculin, and the attack rate of tuberculous disease in students negative and positive to tuberculin on admission.

of two and one-tenth years, no infiltrations have developed.

Erythema nodosum was observed in 4 students. In 2 instances the attacks were associated with the development of a positive tuberculin reaction, and a tuberculous etiology might for this reason be suspected; but in the other 2 instances the students had been tuberculin positive on admission. Accordingly, in this study the diagnosis of tuberculosis has not been made on the basis of erythema nodosum alone.

Extrathoracic tuberculosis was not observed except for a perirectal abscess in 1 student who had an associated pulmonary lesion.

RELATION TO TUBERCULIN REACTION

In no instance was an infiltration typical of tuberculosis observed in a student who gave a negative reaction to the tuberculin test. One instance of mediastinal lymph node enlargement, however, was observed in a student who repeatedly failed to react. After nine months' observation a positive reaction was obtained in this student, and simultaneously a pulmonary infiltration with cavity was noted.

Tuberculous lesions, including both infiltrations and pleurisy, developed in 34 of the 277 students who had been tuberculin negative on admission. This represents an annual attack rate of 5.43 per cent. In the group originally reacting to the second dose of tuberculin (0.005 mg. of purified protein derivative), consisting of 183 students, tuberculous lesions developed in 22, an annual rate of 6.05 per cent. In the group of 183 students originally reacting to the first dose of tuberculin (0.00002 mg. of purified protein derivative), 177 were at risk, 6 having had tuberculosis on admission. Tuberculous lesions developed in 11, an annual incidence of 2.7 per cent. Combining the latter two groups, the annual attack rate in students originally tuberculin positive was 4.3 per cent as shown in the accompanying table.

Thus, although the results of the present study tend to agree with other studies that the incidence of tuberculosis is greater in negative and in slight reactors, the striking feature of this study is the smallness of the difference. Actually, the differences in incidence of tuberculosis among these various groups are not significant on statistical analysis.[1]

TIME OF DEVELOPMENT OF TUBERCULOSIS

No tuberculous lesions appeared during the first four months of training, and only 3 developed during the second four month interval. The attack rate for the entire group rose rapidly thereafter, reaching a maximum in the second year of training; during the third year the attack rate began to decline. Our observation of graduate nurses was not carried out at regular intervals, and quantitative comparison with the attack rate among students is impossible; but the development of tuberculosis appeared to be considerably less common after graduation than before, possibly because in the more susceptible persons the disease had already developed.

The time of occurrence of tuberculosis differed distinctly in students tuberculin negative on admission and those who were tuberculin positive (fig. 1). In the former group, the lesions developed considerably earlier and the attack rate fell off sharply in the third year. Among students reacting to tuberculin on admission, the attack rate rose very slowly and reached its maximum in the third year of training.

The difference in behavior of students tuberculin negative and tuberculin positive on admission suggests that the small difference in incidence observed between the two groups was not due to chance but was indicative of a consistent, if slight, relation to the original tuberculin reaction.

TYPE OF TUBERCULOSIS

More controversial than the reports on the relative incidence of tuberculosis in negative and positive reactors are the reports on the anatomic character and clinical course of the disease in the two groups. In the present series, mediastinal or hilus lymphadenopathy sufficiently distinct to be definitely distinguished on fluoroscopic and film examination was observed in only 1 student. It appears significant that this was also the single instance in which disease was present prior to the development of a positive tuberculin reaction. The other lesions that developed were pulmonary infiltrations of reinfection type. Figures 2 and 3 show

1. By chi square test, with Yates's correction.

that there was no appreciable difference in site of appearance of lesions between the groups originally negative and those positive to tuberculin.

It has proved possible to classify the clinical course of the lesions observed into four groups: rapidly retrogressive lesions, which resolved and scarred in a period

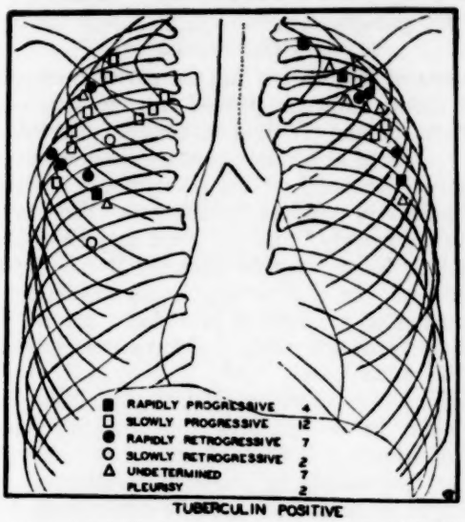

Fig. 2.—Site of appearance of lesions in 34 nurses tuberculin positive on admission to training.

of a few months with little or no treatment; slowly retrogressive disease, which scarred and contracted only after several years' observation; rapidly progressive lesions, which uninterruptedly extended, usually showing cavity formation within a few months, and slowly progressive lesions, which after intervals of stability of retrogression either finally progressed to advanced disease or remained unstable in appearance, more extensive than when first discovered. The type of disease was undetermined in 12 students in whom the period of observation was too short to ascertain the course.

Among students originally negative to tuberculin there developed 5 rapidly progressive lesions, 10 slowly progressive lesions, 6 rapidly retrogressive lesions and 3 slowly retrogressive lesions (fig. 3). Pleurisy without parenchymal infiltration occurred in 5 students of this group. Lesions among students originally reacting to the second dose of tuberculin were rapidly progressive in 2 instances, slowly progressive in 7 instances, rapidly retrogressive in 6 instances and slowly retrogressive in 1 instance. In 2 students of this group pleurisy with effusion developed. Among the students originally reacting to the first dose of tuberculin the disease was rapidly progressive in 2 instances, slowly progressive in 5 instances, rapidly retrogressive in 1 instance and slowly retrogressive in 1 instance. These differences are not significant except for the low proportion of retrogressive lesions in students originally reacting to the first dose of tuberculin.

In several cases, the lesion retrogressed rapidly to form a nodule. In none of these instances has the deposition of calcium been observed on roentgen examination.

RELATION TO AGE AND TO URBAN OR RURAL ORIGIN

The mean age on admission of students in whom tuberculosis developed was 18.8 years, as compared to the average age of 19.8 years for the entire group. However, those aged 22 to 31 years on admission, comprising 8.7 per cent of the total number of students, included 13.5 per cent of the students in whom tuberculosis developed.

The students have been classified into two groups according to residence at the time of admission to training school. Of the 230 students coming from rural areas (farms and villages of less than 2,500 population), 50.4 per cent were tuberculin positive on admission. Among urban students, 60.5 per cent reacted. The percentages in whom tuberculosis developed were almost identical, 10.7 among students from urban homes and 10.9 among students from rural homes. The annual attack rates were 4.6 per cent and 5.2 per cent respectively.

CLINICAL MANIFESTATIONS OF TUBERCULOUS INFECTION

The occurrence of vague, poorly localized symptoms among adults at the time of tuberculous infection has been described by numerous European observers,[2] and Scandinavian investigators [3] have noted the frequency of abdominal symptoms so closely simulating appendicitis that laparotomy is often performed. A record has been compiled of the nonspecific respiratory, gastrointestinal and toxic or febrile illnesses occurring in the student nurses under observation. Only illnesses sufficiently severe to require admission to the infirmary or a roentgen examination of the chest have been included. It was found that 825 such illnesses occurred among the student nurses during a total of one thousand, two hundred and forty-six and two-tenths years of observation, representing an annual attack rate of 66.2 per cent, while the rate was almost twice as high, 130.4 per hundred students, during the four month period immediately preceding the development of a positive tuberculin test. Appendectomies were performed on 61 students, representing an annual attack

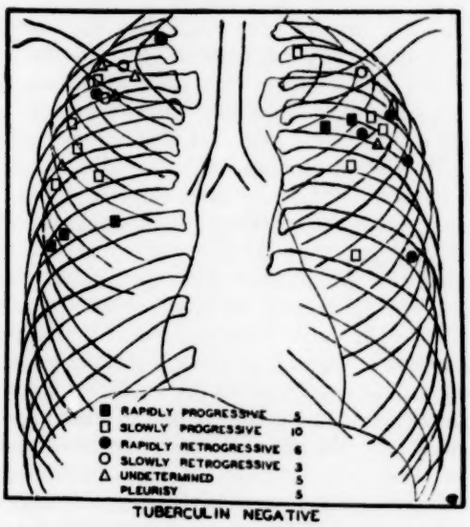

Fig. 3.—Site of appearance of lesions in 34 nurses tuberculin negative on admission to training.

rate of 4.9 per cent. Twelve of these appendectomies were performed during the four month interval preceding the occurrence of a positive tuberculin test, representing an attack rate of 14.8 per cent, three times

2. Rist, E.; Reyt, P., and Tuchila, J.: La cuti-réactivité à la tuberculine chez les élèves de l'Ecole d' infirmières de la Salpêtrière, Bull. Acad. de. méd., Paris **119**: 52-63 (Jan. 11) 1938.

3. Holm, Johannes: Personal communication to the authors.

as high. That this high attack rate is not merely the result of the strain of entering training school is shown by the fact that the appendectomy rate among the positive reactors during the first eight months of training was not appreciably higher than the general average.

PRIMARY TUBERCULOSIS

The term "primary tuberculosis" has not been employed thus far in this report. We [4] have pointed out in a previous report the confusion which attends this term. With serial tuberculin tests, as in the present study, it might appear possible to differentiate the primary and reinfection types or phases of disease with accuracy. Two difficulties occur, however. The first is the possibility that the students tuberculin negative on admission to the nursing school have been previously infected and have lost their sensitivity to the conventional doses of tuberculin without losing their acquired "immunity" in whole or in part. That this possibility is not negligible is indicated by the high percentage of tuberculin-negative students who had calcifications typical of healed tuberculous lesions. The second difficulty is the absence of criteria for determining how long after infection a developing lesion is to be considered "primary." Few investigators have ventured to define these limits. Burrell [5] suggested that the lesions developing during the incubation period, i. e. the interval between infection and the development of allergy, be designated as "primary." This definition has been dismissed by the committee on nomenclature of the National Tuberculosis Association as unpractical because the number of lesions falling in this group is so small.[6] Another guide to differentiation is suggested by Heimbeck's remark [7] that the majority of primary lesions "occur shortly after infection and that the outermost limit is one year after the development of a positive tuberculin test." Heimbeck in his studies accordingly records observation of originally negative reactors only up to one year after the development of a positive test; subsequent observation of these individuals is recorded with the experience of those tuberculin positive. Adopting this scheme for classifying our observations, we find that 22 cases of tuberculosis developed among the tuberculin-negative reactors who were observed for a total of three hundred and eighty-one and one-tenth years, an annual attack rate of 5.78 per cent; in the remaining one thousand and thirty-one and three-tenths years in which positive reactors were observed, 46 cases developed, an attack rate of 4.46 per cent. This difference is not significant statistically. It should be recognized, however, that if the tuberculin-negative years are excluded, an extremely high incidence of tuberculous infiltrations and pleurisy is found during the year following the development of a positive tuberculin reaction. It also appears to be true that a difference in course of the disease exists between lesions appearing within a year after the development of a positive tuberculin reaction and lesions developing subsequently. Lesions in the former category were rapidly progressive in 4 instances, slowly progressive in 5 instances, rapidly retrogressive in 6 instances and slowly retrogressive in 1 instance. The corresponding figures for the tuberculin-positive group were 6, 16, 7 and 4. The proportion of acute lesions, whether rapidly progressive or rapidly retrogressive, is considerably higher in the "primary" group, whereas the proportions of progressive and retrogressive lesions are similar in the two groups.

COMMENT

The use of fluoroscopy for the periodic examinations at four month intervals proved entirely satisfactory for clinical purposes. With 1 exception, all infiltrations were discovered at a minimal stage, before the onset of symptoms. Reliance on fluoroscopy for epidemiologic study, however, requires justification. We have shown in a previous study [8] that the great majority of minimal tuberculous lesions can be detected by an experienced fluoroscopist. In the present study, the routine film examination on graduation provided a control whereby the accuracy of the routine fluoroscopic examinations could be determined. Only 2 previously undetected infiltrations were discovered by the final film examination, while in 4 instances fluoroscopic examination revealed infiltrations that, obscured by bony shadows, were unrecognizable in single films taken at a 6 foot tube-target distance and could be demonstrated only by stereoscopic films.

The development of pulmonary tuberculosis or pleurisy with effusion in 10.6 per cent of the students at risk, an annual attack rate of 4.81 per cent, is somewhat higher than the annual incidence (1.93 per cent) of clinical tuberculosis reported in student nurses at Bellevue Hospital [9] and is slightly higher than the annual incidence (3.2 per cent) reported in student nurses at the Cincinnati General Hospital.[10] In contrast to these figures, however, is the low incidence of tuberculosis observed to develop in young women of comparable age employed by the Metropolitan Life Insurance Company.[11] Annual fluoroscopic examination in the group aged 17 to 24 years, most of whom were clerical employees, revealed an annual attack rate of 0.32 per cent. It is possible that a higher incidence might have been found had the examinations been made at four month intervals, but it is probable that the increase would have been slight. An equally significant difference in incidence of tuberculosis between nurses and other women of similar age was found by Heimbeck in Norway.[12] These studies indicate that the incidence of tuberculous infection and the attack rate of roentgenologically demonstrable tuberculosis is far higher in the nursing students of a general hospital with a large tuberculosis service than in the population at large.

On the other hand, it is doubtful whether serious illness and death from tuberculosis are much more frequent in nurses than in other young women. We have pointed out in a study of young physicians that medical students with tuberculosis have a low death

4. Israel, H. L., and Long, E. R.: Primary Tuberculosis in Adolescents and Young Adults, Am. Rev. Tuberc. **43**: 42-55 (Jan.) 1941.

5. Burrell, in Report of the Tenth International Conference Against Tuberculosis, Lisbon, 1937, p. 373.

6. Diagnostic Standards, New York, National Tuberculosis Association, 1940.

7. Heimbeck, Johannes: Tuberculosis in Hospital Nurses, Tubercle **18**: 97-99 (Dec.) 1936.

8. Israel, H. L., and Hetherington, H. W.: Accuracy of Fluoroscopy in the Detection of Pulmonary Tuberculosis, Am. J. M. Sc. **201**: 224-232 (Feb.) 1941.

9. Riggins, H. M., and Amberson, J. B., Jr.: Detection and Control of Tuberculosis Among Nurses, Am. J. Nursing **40**: 1137-1144 (Oct.) 1940.

10. Welborn, M. B.: Incidence of Tuberculosis Among the Personnel of the College of Medicine, University of Cincinnati and the Cincinnati General Hospital, J. Med. **18**: 563-566 (Jan.) 1938.

11. Reid, A. C.: Control of Tuberculosis: II. Pulmonary Tuberculosis in Employes, J. Indust. Hyg. & Toxicol. **22**: 408-415 (Nov.) 1940.

12. Heimbeck, Johannes: Incidence of Tuberculosis in Young Adult Women with Special Reference to Employment, Brit. J. Tuberc. **32**: 154-166 (July) 1938.

rate and exhibit considerably more resistance to the disease than is encountered in clinic or hospital patients with similar lesions.[13] This high level of resistance is apparently shared to some extent at least by students of nursing. In the present series, which includes 68 students in whom tuberculosis developed and 6 students who had the disease on admission, there have been no deaths. One student has undergone thoracoplasty, 9 students have received pneumothorax treatment and 2 have received prolonged sanatorium care; the remainder have received relatively brief periods of rest treatment or no treatment at all. In the treated as well as in the untreated, it is our impression that the course of the disease was much less severe than that observed in clinic patients with lesions equally dangerous in appearance. Presumably this greater resistance of nurses and medical students is the result of social and economic factors and because of prompt treatment rather than, as Brahdy [14] has suggested, because most of the lesions occurring in nurses are primary and hence benign.

Whether the term "primary" tuberculosis is restricted to disease appearing within a year of the development of a positive reaction, or whether it is taken to include all disease appearing in students tuberculin negative at the onset of observation, it is clear that in the present study primary tuberculosis exhibited no characteristics of incidence, pathologic type or clinical course to distinguish it clearly from disease developing in students known to be long infected. The disease observed was neither especially malignant, as reported by Scandinavian investigators,[15] nor unfailingly benign, as reported by Brahdy [14] and Myers.[16] Roentgenologically, the "primary" lesions differed perceptibly in 1 instance only from the infiltrations considered typical of the reinfection type. The classic complex of primary tuberculosis, seen so commonly in roentgenograms of children and of adult aborigines, and observed occasionally following primary infection in adolescent Negroes, is apparently rare in young white adults in this country. In our experience, the development of classic primary tuberculosis appears to be determined more by age-linked and racial factors than by the presence or absence of allergy to tuberculosis. Thus, a possible explanation for the differences in the character of the tuberculosis noted in American and Scandinavian nurses is suggested by Lurie's [17] observations in an epidemiologic study of resistant and susceptible strains of rabbits. In the highly susceptible animals he found that lesions are of "primary type," even though preceded by immunizing procedures. In the highly resistant animal, lesions are anatomically of localized "reinfection type," regardless of whether previous infection has occurred, while in the animal of intermediate resistance the presence or absence of previous infection determines the development of reinfection types of lesions.

The more common occurrence of disseminated disease with high mortality and the relationship to prior tuberculin reaction noted in Scandinavian studies suggest that the students of nursing in those countries are of intermediate resistance, while the development of the reinfection type of disease with few extrapulmonary manifestations and no deaths, regardless of the previous status of the tuberculin reaction, observed in the present study, may be considered evidence that the majority of these young women are highly resistant to tuberculosis, by reason of genetic or, more probably, nutritional and environmental factors.

The observation that vague symptoms frequently accompany the development of a positive tuberculin reaction is of considerable practical interest. Extra caution should perhaps be exercised in the diagnosis of appendicitis in a person who is known recently to have given a negative reaction to tuberculin and who is known to be exposed to tuberculous infection.

The problem of tuberculosis among students of nursing should be neither minimized nor exaggerated. The rapid rate of infection and the high incidence of pleural and of pulmonary lesions demonstrate that the student of nursing in the general hospital encounters an unusual hazard from tuberculosis. The need for strict prophylactic measures for protection of hospital personnel is evident. On the other hand, as the result of social, economic and medical advantages, the immediate, and possibly the ultimate, mortality among nurses is low. A considerable proportion of the lesions retrogress without treatment, but this is equally true of disease appearing in students tuberculin positive and tuberculin negative on admission. No tuberculous lesion in an adult should be dismissed as benign merely because it is believed to be of primary type.

SUMMARY

1. Periodic examination with the tuberculin test and fluoroscopy was given to 643 students of nursing at the Philadelphia General Hospital. A rapid rate of infection was noted. At the end of four months, 48 per cent of those originally giving a negative reaction reacted to tuberculin, at the end of one year 85.9 per cent reacted and at the end of three years 100 per cent reacted.

2. A high incidence of pleurisy with effusion and of pulmonary infiltrations roentgenologically typical of tuberculosis was observed. The annual attack rate was 4.81 per cent, an incidence slightly higher than that reported in similar large general hospitals.

3. Serious illness from tuberculosis, however, was not proportionately frequent, and no deaths occurred, presumably in part because of prompt treatment.

4. Only slight differences in incidence and in anatomic character and distribution of tuberculosis as determined by roentgenologic examination were observed between students who had been tuberculin negative at the onset of observation and students who had been tuberculin positive on admission. Comparison of the subsequent clinical course of students in the two groups showed no difference in the proportions of progressive and retrogressive lesions.

5. The development of a positive tuberculin reaction was associated with a high incidence of nonspecific respiratory, gastrointestinal, febrile and vague toxic illness and with an especially high frequency of abdominal symptoms simulating appendicitis.

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ABSTRACT OF DISCUSSION

DR. H. C. STEWART, Cleveland: The topic selected is important to those whose primary interest is in hospital administration and also to those engaged in the study of tuberculosis and its control. The tuberculosis morbidity rate in this particular group seems rather high, being close to 5 per cent annually. Most of the studies of the occurrence of tuberculosis in household associate groups show this rate to be between 1 and 2 per cent annually among white persons. The group under discussion, however, is highly selected as to age, sex and occupation and is therefore not strictly comparable to a general population group. In this particular series, every nurse became infected with the tubercle bacillus before the expiration of her training period. Another point of interest is that the results obtained by tuberculin testing on entrance into training did not appear to be related to the development of tuberculous disease at a later time. Studies by Plunkett and his associates in New York State, reported a few years ago, show that a significant proportion of patients hospitalized in general hospitals for conditions other than tuberculosis have unrecognized active pulmonary tuberculosis. At ages above 15 years, 1.1 per cent of such patients had clinically significant pulmonary tuberculosis. In about one half of these cases tuberculosis was not suspected on admission to the hospital. Now, such information as was reported by Plunkett, and studies such as have been presented here, seem to indicate that there is a rather fertile field in general hospitals for the finding of cases of tuberculosis if it is possible to develop some practical way of examining adequately those adults who are hospitalized for any reason in general hospitals.

DR. GEORGE J. BOINES, Wilmington, Del.: I should like to ask the authors whether they have any definite suggestions about nurses in general hospitals; that is, what precautions nurses should take so that they may avoid contact with tuberculosis and the development of tuberculosis. Another question: My impression from previous literature on this subject is that nurses who are negative to the tuberculin test are more susceptible to the infection than those who are positive. My understanding from this paper is that there is very little difference between the two. I was wondering whether this difference is because of the smaller number of nurses examined by these authors or whether there is any difference in taking the tests; to what do they ascribe the difference?

DR. HAROLD L. ISRAEL, Philadelphia: The program for prevention of tuberculosis among the student nurses essentially follows two lines. The first is the detection in the general hospital of the patients who have tuberculosis. There are, as Dr. Plunkett has shown, a very large number of open cases of tuberculosis in the wards of most general hospitals, and the problem is to devise a method of inexpensive roentgen ray examination which can be applied to every person admitted to the wards, so that those who have tuberculosis can be speedily placed in a separate tuberculosis service. The second part of the program involves the prevention of infection of nurses in the tuberculosis service. It would appear that the same type of isolation technic should be practiced as is used with the acute infectious diseases. Possibly some slight, minor modifications can be made, but the essential principles of a strict, aseptic technic should be followed. The studies showing a much higher incidence of tuberculosis among students originally tuberculin negative have for the most part come from the Scandinavian countries. This may be due to the fact that tuberculosis is considerably more prevalent in those countries than in the United States, so that their tuberculin positive nurses are a more highly selected group of resistant persons. American studies tend to show that the incidence is only slightly higher among those originally negative to tuberculin. I think we can draw the conclusion that the importance of the reaction to the tuberculin in determining the development of tuberculosis has been exaggerated at the expense of other factors, genetic as well as environmental.

A BACTERIOLOGIC STUDY OF A NEW SANIGENIC FLOORING

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Epidermophytosis and plantar warts are diseases that are transmitted primarily through the contact of bare feet and contaminated floors. Thus floor sanitation is a problem in locker rooms, shower rooms and runways of swimming pools.

The commonly accepted procedure of control consists in placing footbaths containing antiseptic solutions in doorways to the swimming pool or shower rooms. By this means the feet are at least momentarily immersed in an antiseptic bath which undoubtedly removes organisms from the feet and also destroys many of them. When the footbath is the sole means of prophylaxis, the bather returns to his locker on contaminated floors and may reinfect his feet before dressing.

TABLE 1.—*Number of Bacteria Removed from Specimens of Cement Floor*

Sample Number	Number of Bacteria Removed
1	7,300,000
2	3,600,000
3	6,320,000
4	2,460,000
5	2,310,000
6	6,430,000
7	7,490,000
8	4,800,000
9	2,630,000
10	1,980,000
11	3,200,000
12	1,480,000
Average	4,167,000

TABLE 2.—*The Oligodynamic Action of Hubbellite on Various Micro-Organisms as Demonstrated by Embedding the Hubbellite in a Seeded Agar Plate*

Test Organisms	Zone of Inhibition in Mm.
Saccharomyces ellipsoideus	9.0
Escherichia coli	6.0
Penicillium italicum	13.5
Staphylococcus aureus	7.5
Epidermophyton interdigitale	15.0

Realizing that reinfection may result from contaminated floors, many establishments as a routine wash all floors carefully and follow this with disinfection. Owing to the frequently continuous use of the locker rooms, showers and swimming pools, the cleaning and disinfection of the floor must be done at the end of the day's use. By this procedure floors become increasingly more contaminated during the day. Cleaning and disinfection function merely as a means of removing each day's increment of pollution; although they may lessen the extent of the contamination, they do not entirely eliminate the danger of floor transmission. That floors properly cleaned each night may carry large numbers of bacteria is demonstrated in table 1 showing the number of bacteria removed from the surface of a 4 inch square of a painted cement floor in a hallway between the showers and the locker rooms in a college gymnasium on different days.

The bacterial population ranged from a minimum of 1,480,000 to a maximum of 7,490,000, with an average of 4,167,000 bacteria.

The number of bacteria thus demonstrated on an apparently clean floor shows the inadequacy of terminal disinfection of floor surfaces as a means of foot-infection prophylaxis.

TABLE 3.—*The Lethal Action of Hubbellite Shown by Addition of Dry Fragments of Hubbellite into Water and Nutrient Broth, Respectively, Seeded with Various Micro-Organisms*

Test Organisms	Percentage Reduction of Organisms				
	1 Hr.	2 Hrs.	3 Hrs.	4 Hrs.	5 Hrs.
Water Menstruum					
Saccharomyces ellipsoideus	0	7	23	30	40
Staphylococcus aureus	0	16	31	49	68
Escherichia coli	0	4	17	34	51
Epidermophyton interdigitale	0	9	30	46	70
Penicillium italicum	0	33	61	75	91
Broth Menstruum					
Saccharomyces ellipsoideus	0	7	27	40	54
Staphylococcus aureus	0	32	58	86	97
Escherichia coli	0	4	21	44	72
Epidermophyton interdigitale	0	8	44	85	98
Penicillium italicum	0	20	64	83	90

There is plainly a need of a method of concurrent disinfection of the floor so that during use the floor surfaces exhibit an antiseptic or disinfectant action.

There has recently appeared on the market a new cement floor surfacing material containing cupric oxychloride called "hubbellite."[1] According to the manufacturer's claim, this flooring when wet releases a minute amount of a copper compound which exerts an oligodynamic action on bacteria in the water film on the floor surface. The antibiotic action of minute amounts of copper is well known, particularly for fungi. As the floor covering is being recommended for surfacing floors in locker rooms, shower rooms and runways of swimming pools, it is well to have available data relating to its possibilities as well as its limitations. This report presents the results of such a study.

Before any extensive work was conducted, a preliminary test was made to determine whether oligodynamic

TABLE 4.—*The Lethal Action of Hubbellite Demonstrated by Addition of Micro-Organisms to Water and Broth, Respectively, to Which Dry Fragments of Hubbellite Were Added Twenty-Four Hours Before the Tests*

Test Organisms	Percentage Reduction of Organisms			
	1 Hr.	2 Hrs.	3 Hrs.	5 Hrs.
Water Menstruum				
Saccharomyces ellipsoideus	34	64	70	76
Escherichia coli	32	56	70	78
Penicillium italicum	66	82	94	99
Staphylococcus aureus	38	57	74	95
Epidermophyton interdigitale	98	83	97	100
Broth Menstruum				
Saccharomyces ellipsoideus	28	44	69	73
Escherichia coli	24	34	68	76
Penicillium italicum	32	77	91	68
Staphylococcus aureus	87	99	100	100
Epidermophyton interdigitale	78	100	100	100

action could be demonstrated. Pieces of hubbellite were embedded into nutrient agar in Petri dishes seeded with various micro-organisms. The cultures were incubated for forty-eight hours and then examined for the presence of zones of inhibition around the fragments of hubbellite. The results are presented in table 2. A yeast (Saccharomyces ellipsoideus), two bacteria (Staphylococcus aureus and Escherichia coli) and two molds (Penicillium italicum and Epidermophyton interdigitale) were used as test organisms. Zones of inhibition of from 6 to 15 mm. were observed. These data show that hubbellite does exhibit oligodynamic action.

A second series of tests were made to determine whether sufficient copper salts could be released in water and in the presence of organic matter to produce antibiotic action. Fragments of hubbellite were dropped into 30 cc. quantities of water and broth respectively, seeded with various micro-organisms. The number of surviving micro-organisms were checked at hourly intervals for five hours. The data are presented in table 3.

These studies reveal that, although no inhibitory action was evident in one hour's exposure, after two hours a distinct diminution in numbers occurred. After five hours' exposure the reductions in numbers varied from 40 per cent for Sacch. ellipsoideus to 91 per cent for P. italicum. The reductions in the presence of organic matter are not particularly different from those obtained in its absence. It is reasonable to expect that the dry material would not yield enough copper ions in one hour to exert germicidal activity. It is evident from these data that the fragments of hubbellite do yield in a reasonable period of time sufficient copper ions to exhibit germicidal activity.

TABLE 5.—*The Lethal Effect on Various Micro-Organisms of Menstruums in Which Hubbellite Was Placed Forty-Eight Hours Prior to Seeding but Removed Before Seeding*

Test Organisms	Percentage Reduction of Organisms				
	1 Hr.	2 Hrs.	3 Hrs.	4 Hrs.	5 Hrs.
Water Menstruum					
Saccharomyces ellipsoideus	19	24	33	35	40
Escherichia coli	4	15	23	33	34
Penicillium italicum	55	80	96	100	100
Staphylococcus aureus	33	65	75	98	100
Epidermophyton interdigitale	44	66	90	98	100
Broth Menstruum					
Saccharomyces ellipsoideus	39	45	56	63	70
Escherichia coli	0	8	25	53	67
Penicillium italicum	0	19	52	85	96
Staphylococcus aureus	0	24	35	55	69
Epidermophyton interdigitale	9	33	42	58	89

To determine the germicidal activity of wet hubbellite, fragments were dropped into flasks of sterile water and sterile broth, respectively, twenty-four hours prior to the introduction of the test organisms. The data from this series of tests are presented in table 4. In this series, germicidal activity ranging from 32 to 98 per cent was obtained after one hour's exposure to the action of copper ions. The E. interdigitale in the absence and presence of organic matter was sharply reduced in one hour. In five hours the culture was completely destroyed. These results would indicate that the bacteria, molds and yeasts deposited on a wet hubbellite surface are destroyed.

To determine the amounts of action attributable to the ions already in solution, fragments of hubbellite were dropped into water and broth, respectively, and left for forty-eight hours prior to seeding with the test organisms. At the time of seeding the fragments

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were removed so that additional ions of copper could not be introduced. Sharp reductions in numbers occurred in one hour in the water but not in the broth. That lethal doses were present is demonstrated by the

TABLE 6.—*The Lethal Effect on Various Micro-Organisms of Hubbellite Determined by Spreading the Test Organisms Suspended in Water on Blocks of Hubbellite*

Test Material	Initial Seeding	Bacterial Counts After Exposure: 4 Hours	8 Hours
	Epidermophyton interdigitale		
Glass plate	50,000	24,000	16,700
Cement		29,000	17,500
Hubbellite no. 1		4,600	122
Hubbellite no. 2		1,100	8
	Staphylococcus aureus		
Glass plate	32,000	17,200	9,100
Cement		16,400	9,600
Hubbellite no. 1		940	11
Hubbellite no. 2		720	2
	Escherichia coli		
Glass plate	92,000	74,000	63,000
Cement		69,000	51,000
Hubbellite no. 1		11,200	2,630
Hubbellite no. 2		7,600	980
	Eberthella typhosa		
Glass plate	102,000	41,000	30,000
Cement		47,000	26,000
Hubbellite no. 1		7,700	1,200
Hubbellite no. 2		2,400	320
	Penicillium italicum		
Glass plate	6,400	7,300	7,000
Cement		5,300	5,000
Hubbellite no. 1		156	11
Hubbellite no. 2		42	0

fact that at the end of five hours sharp reductions occurred. The fact that the rate of reduction was less than in previous experiments in which the fragments were left in the broth and water indicates that the hubbellite continued to give off copper ions as rapidly as they were used up in the killing of the test organisms.

The tests reviewed show definitely that fragments of hubbellite gradually liberate sufficient copper ions to effect destruction of bacteria, yeasts and molds when fragments of the material are submerged in liquids such as water or nutrient broth.

In the next series of tests, 8 inch tiles of hubbellite, ordinary concrete and glass were prepared. On the surfaces of these tiles were smeared bacteria and molds suspended in water and broth, respectively. To prevent evaporation and contamination with air each smear was protected with the cover of a Petri dish. The number of surviving organisms was determined by removing them by means of a moist sterile swab. Swabbings were made at the beginning and at the end of four and eight hour intervals. Three areas were prepared initially to allow the three examinations described previously.

When the bacteria and molds were suspended in nutrient broth (table 7) an increase in numbers occurred when they were smeared on glass and concrete tiles. When the organisms were smeared on hubbellite tiles, the rate of kill was practically as rapid and as effective as in the absence of organic matter.

To ascertain the effect of heavy organic suspensions, market milk was smeared on the tiles in the same manner as previously described. In four hours exposure on hubbellite tiles (table 8) bacterial counts fell from an initial count of 68,000 to 3,800 on tile 1 and to 102 on tile 2. On the concrete tile after eight hours the bacterial count had increased from an initial count of 69,000 to 380,000 bacteria. These data would indicate that floors made of hubbellite in dairies and kitchens would prevent the development of bacteria, whereas concrete floors would allow bacterial growth.

The antibiotic properties of hubbellite were determined practically by placing an 8 foot strip across a hallway in the college gymnasium between the showers and the locker room. By using this location all bathers had to travel over this floor. The amount of traffic over the hubbellite floor was exactly the same as over the adjacent control concrete floor. The floors were cultured by swabbing 4 inch squares with a sterile moist cotton swab. The number of organisms was determined by plating on dextrose agar for a total count: for mold content by plating on Sabouraud's agar. All plates were incubated at 37 C. The results are presented in table 9. An examination of these data shows that the bacterial count was always lower on the hubbellite floor than on the ordinary concrete floor. The mold counts on the

TABLE 7.—*The Lethal Effect on Various Micro-Organisms of Hubbellite Determined by Spreading the Test Organisms Suspended in Broth on Blocks of Hubbellite*

Test Material	Initial Seeding	Bacterial Counts After Exposure: 4 Hours	8 Hours
	Epidermophyton interdigitale		
Glass plate	72,000	128,000	296,000
Cement		112,000	234,000
Hubbellite no. 1		4,200	254
Hubbellite no. 2		2,300	74
	Staphylococcus aureus		
Glass plate	96,000	171,000	498,000
Cement		108,000	121,000
Hubbellite no. 1		2,800	230
Hubbellite no. 2		3,100	500
	Escherichia coli		
Glass plate	161,000	432,000	510,000
Cement		276,000	241,000
Hubbellite no. 1		9,600	1,100
Hubbellite no. 2		1,400	730
	Eberthella typhosa		
Glass plate	128,000	151,000	184,000
Cement		198,000	173,000
Hubbellite no. 1		6,400	820
Hubbellite no. 2		3,800	970
	Penicillium italicum		
Glass plate	8,000	16,500	14,300
Cement		17,000	14,000
Hubbellite no. 1		112	0
Hubbellite no. 2		86	0

TABLE 8.—*The Lethal Action of Hubbellite on the Bacteria in Milk Shown by Smearing Blocks of Hubbellite with Milk*

Test Material	Initial Count	Bacterial Count After Exposure: 4 Hours	8 Hours
Glass plate	68,000	193,000	456,000
Cement		161,000	380,000
Hubbellite no. 1		3,800	460
Hubbellite no. 2		2,400	102

hubbellite floor were extremely low, whereas on the ordinary concrete floor they were comparatively high. In three instances E. interdigitale was isolated from the concrete floor. All samples were obtained in the afternoons when the floors were bearing heavy traffic and all effect of the previous night's cleaning had disappeared.

These data do not prove that the use of hubbellite floors would entirely eliminate epidermophytosis or other infections of the foot which may be transmitted by contaminated floors, but they do demonstrate that the amount of contamination can be materially lessened on the floor and that the danger of infection of the feet is lessened accordingly.

I am of the opinion that, in gymnasiums using properly maintained footbaths supplemented by hubbellite floors on swimming pool runways, in locker rooms and in shower rooms, the danger of contracting floor-transmitted infections of the feet would be reduced to a minimum.

TABLE 9.—*The Incidence of Bacteria and Molds on Hubbellite Floor as Compared to the Adjacent Concrete Floor in a Runway Between a Locker Room and a Shower Room*

	Total Counts		Mold Counts	
Date	Hubbellite	Concrete	Hubbellite	Concrete
5/18/39	820,000	4,736,000	..	.....
5/21/39	435,000	3,800,000*	..	.....
5/24/39	680,000	6,400,000	..	.....
5/26/39	1,200,000	5,980,000	..	.....
8/29/39	890,000	7,300,000	12	265,000*
9/ 1/39	760,000	3,600,000	26	92,000
9/ 6/39	1,120,000	6,320,000	0	61,000
9/10/39	631,000	2,460,000	0	48,000*
10/26/39	426,000	3,260,000	26	67,000
11/ 2/39	737,000	6,340,000	111	109,000
11/ 7/39	153,000	2,180,000	0	49,000
11/11/39	162,000	1,174,000	12	52,000
11/16/39	734,000	4,210,000	132	92,000
11/21/39	432,000	3,680,000	212	38,000
11/26/39	363,000	2,111,000	27	24,000
12/ 4/39	62,000	1,620,000	12	21,000
12/13/39	128,000	2,730,000	9	38,000
12/20/39	221,000	2,976,000	128	71,000
12/28/39	84,000	1,200,000	0	33,000
1/ 4/40	174,000	3,600,000	176	86,000
1/ 8/40	131,000	2,100,000	26	12,400
1/12/40	51,000	1,360,000	14	8,300
1/16/40	186,000	2,300,000	84	34,000
1/28/40	89,000	2,500,000	130	46,000
1/30/40	72,000	3,600,000	240	51,000
2/ 4/40	71,000	4,200,000	25	36,000
2/ 7/40	109,000	3,700,000	306	84,000
2/10/40	36,000	1,087,000	117	39,000
2/13/40	341,000	1,400,000	630	31,000
2/16/40	212,000	2,600,000	89	29,600
2/18/40	428,000	2,200,000	126	86,000
2/22/40	561,000	4,300,000	432	83,000
2/29/40	640,000	6,200,000	510	120,000
Average	398,000	3,431,000	124	62,260

* Epidermophyton interdigitale isolated from the floor.

SUMMARY

1. Fragments of a floor covering called hubbellite introduced into water or broth suspensions of bacteria, yeasts and molds produced lethal effects.

2. When bacteria and molds were smeared on hubbellite tiles in the absence or presence of organic matter, lethal effects were obtained.

3. Under comparative conditions, a hubbellite floor showed lower bacteria and mold counts than ordinary concrete floors.

4. Epidermophyton interdigitale was isolated from ordinary concrete floors in the hallway of a locker room but not from the hubbellite floor.

5. The use of hubbellite floors is an aid in the control of floor-borne infections of the feet.

SIGNIFICANCE OF RISE OF NON-PROTEIN NITROGEN

IN MEDICAL AND SURGICAL JAUNDICE

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The increase of nonprotein nitrogen in the presence of jaundice has received relatively little attention in the diagnosis and management of icteric patients. High values of nonprotein nitrogen in the presence of icterus are usually not appreciated in spite of the fact that reports in the literature point to the comparative frequency of renal injury secondary to hepatic disease. Elevated levels of blood urea nitrogen in liver disease were reported by Wilensky,[1] Meyers,[2] Eiss,[3] Schutz and his associates,[4] Rowntree,[5] Elsom,[6] Hoesch [7] and Nonnenbruch,[8] among others. Wilensky [9] found the incidence of increased urea nitrogen to be proportional to the severity of the disease and to the presence of complications. The presence of a high level of nonprotein nitrogen in Weil's disease is a well known fact.

A perusal of the literature [10] reveals that a rise of the nonprotein nitrogen level in cases of jaundice is a significant sign. It not only indicates an associated renal injury but at times is the first indication of an aggravation of preexisting liver damage, or of the onset of secondary parenchymatous involvement in case of obstructive icterus. Hence it is surprising that while numerous liver function tests, some of which still remain sub judice, are repeatedly discussed in the differential diagnosis of jaundice, such a simple test as the determination of the nonprotein nitrogen of the blood is just as often not mentioned.

The question will arise which one of the different nitrogenous products if increased may have significance in the clinical evaluation. In animal experiments,[11] liver extirpation has led to a decrease of the urea level. In man, however, ambiguous results were obtained. In relatively few cases of liver damage is there a decided

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lowering of the urea level,[12] while in the majority of them high urea values are obtained. All workers, however, agree that the nonprotein nitrogen is usually increased.

For the past few years we have made this problem a part of our icterus studies on a large series of jaundiced patients from the medical and surgical services of the Cook County Hospital. The results to be reported are based on a total of 180 cases of jaundice divided into four groups and subdivided according to the highest reported nonprotein nitrogen level (table 1). The figures quoted do not deal with the postoperative stage, as the diagnostic value of the rise in nonprotein nitrogen is the one to which attention is being given. The feature of so-called liver death with hyperpyrexia, hepatorenal syndrome and the like [13] supposedly following decompression of the liver does not form a part of this paper.

To evaluate the results in each group, the percentage of recovery and mortality was indicated. One has to consider, however, that the mortality is not due merely to the liver damage. In cases of cirrhosis intercurrent death is common, and in cases of malignant obstruction the tumor leads to a fatal outcome.

TABLE 1.—*Blood Nonprotein Nitrogen in Various Types of Jaundice, Showing Percentage of Recovery and Death* *

	Nonprotein Nitrogen of the Blood													
	Normal					40-70					Over 70				
		Death		Recovery			Death		Recovery			Death		Recovery	
Type of Cases	Cases, Number	Number	Per Cent	Number	Per Cent	Cases, Number	Number	Per Cent	Number	Per Cent	Cases, Number	Number	Per Cent	Number	Per Cent
Hepatitis	29	1	3.4	28	96.5	19	3	16	16	84	6	4	66.6	2	33.3
Cirrhosis	19	8	42	11	58	13	6	46	7	54	7	5	76	2	24
Benign obstructive	24	2	8	22	92	17	2	12	15	88	1	1	100		
Malignant obstructive	21	15	71	6	29	22	19	86	3	14	4	4	100		
Total	93	26	28	67	72	71	30	42	41	58	18	14	78	4	22

* The highest nonprotein nitrogen level in each case was taken.

As shown by table 1, a moderate increase in nonprotein nitrogen was present in 39 per cent and a high increase in 10 per cent of all cases. The mortality rate rises definitely with the rise in the nonprotein nitrogen level. This is especially apparent from the cases of acute hepatitis and benign obstruction, in which death is more often due to the liver damage itself. The mortality of 78 per cent in the cases of all groups in which there was a nonprotein nitrogen level of over 70 mg. per hundred cubic centimeters requires emphasis. Thus in the cases of acute hepatitis the mortality of 3.4 per cent in the group in which there is a normal nonprotein nitrogen rises to 16 per cent in that in which there is a moderate increase in nonprotein nitrogen and to 66 per cent in the group in which there is a nonprotein nitrogen of over 70 mg. Similarly, in benign obstruction the mortality percentage rises from 8 to 12 to 100 respectively.

The significance of the nonprotein nitrogen level as a prognostic sign in cases of jaundice is evident from table 1. It is further borne out by observations on individual patients on whom repeated determinations of the nonprotein nitrogen were performed. An increase of the nonprotein nitrogen occurs in acute hepatitis and cirrhosis at a time when the liver damage increases and the icterus deepens. In surgical jaundice (benign and malignant obstruction), a rise of the nonprotein nitrogen usually is preliminary to a secondary involvement of the liver parenchyma, as shown by other more complicated liver function tests (galactose, hippuric acid, cholesterol-ester ratio). In the latter type of cases, therefore, the increase of the nonprotein nitrogen may be an urgent indication for surgical removal of the obstruction.

The increase of the nonprotein nitrogen in disease of the liver, especially when there is involvement of liver parenchyma in surgical jaundice, is therefore of diagnostic value. The pathogenesis of this increase is not as yet established. On the one hand it may represent a manifestation of the so-called hepatorenal syndrome [14] with kidney damage as the cause of the retention of the nitrogenous substances; on the other hand, it may exemplify the extrarenal azotemia. In the latter, the azotemia is due not to a primary pathologic condition of the kidney but to another pathologic process (heart disease, hypochloremia, intestinal obstruction, diabetic coma) in which the high nonprotein nitrogen is supposedly due to an increased supply of nitrogenous substances, on the basis of a breakdown of tissue proteins in connection with dehydration and changes in the mineral metabolism.

There are references about renal disorders in cases of jaundice, and icteric nephrosis is described. There is no question that tubular degeneration is seen in jaundice.[15] Nephrosis, however, does not lead to an increase of the nonprotein nitrogen. Hence the morphologic demonstration of the picture of icteric nephrosis does not answer our question. Furthermore, the microscopic picture in such cases does not reveal inflammatory processes of the glomeruli which might be responsible for filtration damage and consequent increased nonprotein nitrogen.

In order to investigate alterations of the glomerular function without underlying anatomic changes, urea and creatinine clearance was repeatedly studied in 16 cases of jaundice, of which 10 showed an increase of the nonprotein nitrogen up to 93 mg. per hundred cubic centimeters. In the surgical cases the examinations were repeated after operation. The endogenous creatinine clearance was considered as glomerular filtration rate.

12. Chasatzky, J. S.: Ueber den Reststickstoff des Blutes den N des Harnstoffes und der Aminosäuren des Blutes bei Leberinsuffizienz, Ztschr. f. klin. Med. **105**: 349-364, 1927. Nonnenbruch, W.: Die Hepatorenale Syndrome und die hyposthenurie-N, Klin. Wchnschr. **18**: 917-919 (July 8) 1939.

13. Heyd, C. G.: Liver Deaths in Surgery of Gallbladder, J. A. M. A. **97**: 1847-1848 (Dec. 19) 1931. Boyce, F. F., and McFetridge, E. M.: So-Called "Liver Deaths": A Clinical and Experimental Study, Arch. Surg. **31**: 105-136 (July) 1935.

14. Dérot, Maurice, and Dérot-Picquet, Renée: Les hépatonéphrites, Paris, J. B. Baillière et fils, 1936. Vague, Jean: Les hépatonéphrites aiguës, Paris, Masson & Cie, 1935. Pytel, A.: Zur klinischen Charakteristik der Hepatorenalen Syndromen, Wien. klin. Wchnschr. **50**: 965-968 (June 25) 1937.

15. Thompson, L. L., Jr.; Frazier, W. D., and Ravdin, I. S.: The Renal Lesion in Obstructive Jaundice, Am. J. M. Sc. **199**: 305-312 (March) 1940. Stewart, H. L.; Cantarow, Abraham; Morgan, D. R.: Renal Changes in Biliary Stasis and Decompression in Cats, Arch. Path. **19**: 807-818 (June) 1935.

Although theoretically the basis of creatinine clearance is still not decided [16] and the inulin clearance is, therefore, considered superior, for practical clinical purposes the creatinine clearance may be nevertheless sufficient.[16a] Endogenous creatinine is filtered, not reabsorbed, and supposedly not secreted. Changes in the endogenous

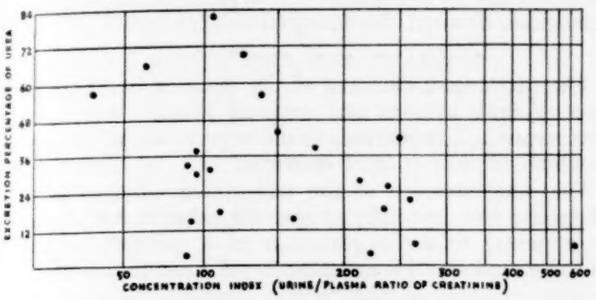

Chart 1.—Semilogarithmic plot of urine-plasma ratio of creatinine against excretion percentage of urea in cases of jaundice.

creatinine clearance would therefore be considered a sign of glomerular alteration.

The behavior of urea, which is the chief constituent of the nonprotein nitrogen, is significant for the explanation of the increase of the nonprotein nitrogen even though the share of the urea nitrogen in the total nonprotein nitrogen varies. However, it is also questionable how much of the non-urea nitrogen passes in the urine.

The urea clearance is usually somewhat lower than the creatinine clearance, as part of the urea is reabsorbed in the tubular system. The ratio between the two clearances could be considered a measure of the urea reabsorption. If an increased breakdown of proteins is the chief cause for the increased nonprotein nitrogen, the urinary excretion of urea would be high. In the latter case, the urea clearance would be near the creatinine clearance, since reduction of the urea reabsorption would compensate for the increased supply.

PROCEDURE

The fasting patient was catheterized and a retention catheter instilled. The obtained sample of urine was discarded. After a noted time (about two hours) another specimen of urine was obtained. Blood was drawn during this time into an oxalated bottle. Plasma was quickly separated from the blood, and the urea and the creatinine content of plasma and urine and further the nonprotein nitrogen and the chlorides of the plasma were determined.

Creatinine was determined according to Popper, Mandel and Mayer [17] and urea according to Koch.[17a]

Creatinine clearance (glomerular filtration [18]) and urea clearance were calculated as urine-plasma ratio times urinary output per minute. As measurement of urea reabsorption, the excreted urea in percentage of the filtrate was figured from the urea clearance/creatinine clearance ratio times 100.

Evaluation of the obtained creatinine clearance levels shows them to be normal or moderately reduced, from 162 cc. to 60 cc. (26.8 cc. in 1 case). This reduction of the glomerular filtration agrees with the results of Popper and Mandel [19] and further with animal experiments and clinical studies of Hiratsuka.[20]

Increase of the plasma creatinine is another sign of filtration damage.[21] In our cases the plasma creatinine was generally normal or only slightly increased (except for one case in which there was a creatinine value of 2.04 mg. per hundred cubic centimeters), although the nonprotein nitrogen showed a definite increase. In 6 cases with an increased nonprotein nitrogen a normal creatinine value, i. e. below 1 mg. per hundred cubic centimeters, was encountered.

In cases of nephritis the increase of the plasma creatinine and the reduction of the glomerular filtrate is more pronounced than the corresponding rise in the nonprotein nitrogen. Our cases show in this respect similarity to the slight reduction of filtration in other extrarenal conditions as in cardiac patients.[22] The relatively mild reduction of the glomerular filtrate in the group studied is therefore only partly responsible for the increased nonprotein nitrogen.

The urea clearance was relatively more reduced than the creatinine clearance. The ratio between urea clearance and creatinine clearance indicates the excreted

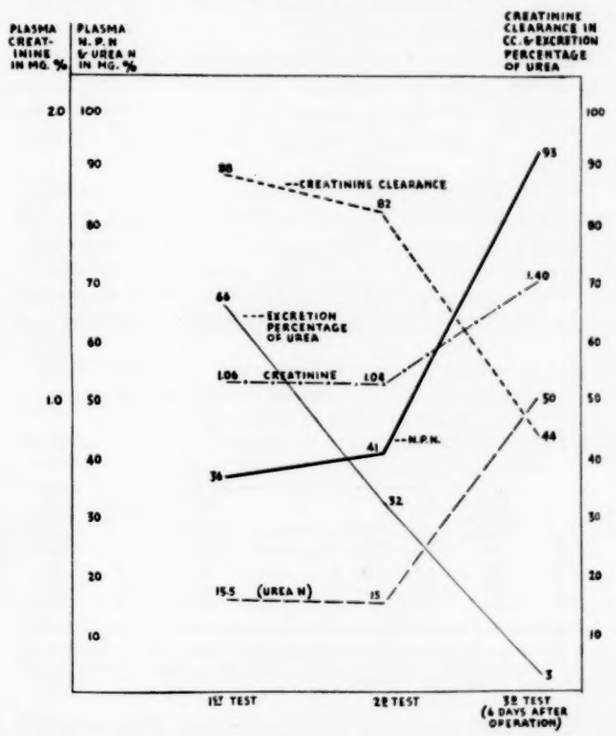

Chart 2.—Plasma nonprotein nitrogen, urea nitrogen and creatinine, creatinine clearance and excretion percentage of urea in a representative case of surgical jaundice with fatal termination after operation.

part of the filtered urea. If the ratio is low, as in our cases, the urea reabsorption in the tubular system is relatively high. Chasis and Smith [23] have shown that

16. Smith, W. W.; Finkelstein, Norma, and Smith, H. W.: Renal Excretion of Hexitols (Sorbitol, Mannitol and Dulcitol) and Their Derviatives (Sorbitan, Isomannide and Sorbide) and of Endogenous Creatinine-like Chromogen in Dog and Man, J. Biol. Chem. **135:** 231-250 (Aug.) 1940.

16a. Steinitz, Kurt, and Türkand, Hüsnü: The Determination of the Glomerular Filtration by the Endogenous Creatinine Clearance, J. Clin. Investigation **19:** 285-298 (March) 1940.

17. Popper, Hans; Mandel, Emil, and Mayer, Helene: Zur Kreatininbestimmung im Blute, Biochem. Ztschr. **291:** 354-367, 1937.

17a. Koch, F. C.: Practical Methods in Biochemistry, Baltimore, William Wood & Co., 1935, pp. 121-122.

18. Rehberg, P. B.: Studies on Kidney Function: I. Role of Filtration and Reabsorption in the Human Kidney, Biochem. J. **20:** 447-460, 1926.

19. Popper, Hans, and Mandel, Emil: Filtrations und Resorbtionsleistung in der Nierenpathologie, Ergebn. d. inn. Med. u. Kinderh. **53:** 685-794, 1937.

20. Hiratsuka, Gumpeire: Ueber die veränderungen der glomerulären Filtration und tubulären Rückresorption der Niere bei Lebenkrankheiten und experimentellen Lebenschädigungen, Tohoku J. Exper. Med. **31:** 232-246, 1937.

21. Popper, Hans, and Brod, Jan: Die physiologischen Schwankungen der Nierenarbeit, Ztschr. f. klin. Med. **134:** 196-223, 1938.

22. Popper, Hans; Mandel, Emil, and Mayer, Helene: Die diagnostische Bedeutung der Plasma Kreatininebestimmung, Ztschr. f. klin. Med. **133:** 56-77, 1937.

23. Chasis, Herbert, and Smith, H. W.: Excretion of Urea in Normal Man and in Subjects with Glomerulonephritis, J. Clin. Investigation **17:** 347-358 (May) 1938.

the urea reabsorption depends on the concentration of the urine, as indicated by the urine-plasma ratio of a not reabsorbable substance (inulin). The same significance has—as shown by Steinitz and Türkand [16a]—the urine-plasma ratio of endogenous creatinine. Arkin and Popper,[24] using the creatinine method, found the same relation between urea reabsorption and urine concentration. They observed a high excretion percentage and consequently a low urea reabsorption in cases in which there was anatomic renal damage. Chart 1 shows in comparison with the graph of Arkin and Popper that the excretion percentage is mostly in the lower ranges and that consequently the urea reabsorption is relatively high in the cases of jaundice in which examinations were made. The concentration power as measured by the urine-plasma ratio of creatinine shows no deviation from the normal. This fact does not indicate a hypostenuria as the reason for the increase of the nonprotein nitrogen. Chart 2 shows the behavior in a representative case in which, parallel with a downhill course, the excretion percentage of urea decreases and the urea reabsorption increases. This case does not fit in with those described as typical liver death, as first hyperpyrexia was absent and secondly the finding at operation (biliary cirrhosis due to prolonged obstruction) could explain the gradual downhill course of this patient. Whether the same mechanism holds for real liver death has to be studied. The blood chloride level in the cases in which examinations were made was relatively low but never reached the low level of real hypochloremia.

The results offer no indication for an increased nitrogen supply to the blood as reason for the increased nonprotein nitrogen. They suggest an increased reabsorption of urea in cases of liver damage. Whereas in kidney damage a resorption uremia [25] could be excluded in accordance with Smith,[26] this possibility remains for

TABLE 2.—*Blood Chemistry, Glomerular Filtration, Urea Excretion Percentage, During the Recovery in a Case of Hypochlorazotemia* *

	Plasma				Urine Plasma Ratio of Creatinine		
Date	Nonprotein Nitrogen	Chlorides	Urea Nitrogen	Creatinine		Glomerular Filtration	Excretion Percentage of Urea
7/13	187	310	112.5	6.72	18.5	17.5	6.5
7/15	171	355	101.3	4.37	19.8	50.9	18.1
7/19	124	495	50.0	2.32	28.3	57.6	48.0

* A Negro aged 28, admitted in comatose stage with a history of severe gastroenteritis (vomiting and diarrhea). There was gradual improvement on chloride therapy.

the extrarenal azotemia. McCance and Widdowson [27] showed disorganization of the renal function in diabetic coma, the breakdown of the barrier function of the tubules being responsible for the backflow of the nitrogenous substances. A trend in this direction was found in our cases and may be brought in relation to the tubular changes as seen microscopically.

We had the chance to examine 1 patient with hypochlorazotemia following gastroenteritis with complete recovery. Again the urea clearance is extremely low in comparison with the slightly reduced creatinine clearance. As the latter is considered a measure of the glomerular filtration, an increased reabsorption of urea in the tubules is to be assumed. This case being more developed supports the hypothesis that the high nonprotein nitrogen in jaundice is due less to filtration damage than to increased reabsorption of nitrogenous substances, through the damaged tubular barrier.

24. Arkin, Aaron, and Popper, Hans: Urea Reabsorption—Relation Between Creatinine and Urea Clearance in Renal Disease, Arch. Int. Med. **65**: 627-637 (March) 1940.

25. Ferro-Luzzi, G.: Die Nierenfunktion im Lichte moderner Anschauung: Studien über die Tubuliresorption, Ztschr. f. exper. Med. **94**: 708-721, 1934.

26. Smith, H. W.: Studies in the Physiology of the Kidney: Porter Lectures Series IX, University Extension Division, University of Kansas, Lawrence, Kan., 1939.

27. McCance, R. A., and Widdowson, E. M.: Functional Disorganization of the Kidney in Disease, J. Physiol. **95**: 36-44 (Sept.) 1938.

SUMMARY AND CONCLUSIONS

The nonprotein nitrogen of the blood is increased in cases of both medical and surgical jaundice of severe involvement. The increase is more pronounced in cases in which there is a fatal outcome.

The determination of the nonprotein nitrogen is of diagnostic and especially prognostic value in such cases, as it points to an aggravation of a parenchymatous jaundice and to the appearance of a secondary liver damage in cases of obstructive jaundice. Increase of nonprotein nitrogen in a case of surgical jaundice suggests an early operative intervention.

The increased nonprotein nitrogen is to some extent explained on the basis of a reduction of glomerular filtration, but to a greater extent it is due to increased reabsorption of urea in the kidney tubules.

An increased breakdown of protein as a cause of the increased nonprotein nitrogen is not evident from our experiments.

Clinical Notes, Suggestions and New Instruments

PEMPHIGUS FOLIACEUS-LIKE ERUPTION FOLLOWING USE OF SULFANILAMIDE AND SULFAPYRIDINE

MAX S. WIEN, M.D., AND EUGENE P. LIEBERTHAL, M.D., CHICAGO

The increasing use of sulfanilamide, sulfapyridine and related compounds by physicians and their description in the lay press with subsequent indiscriminate, uncontrolled use by the public emphasize the important need for the medical profession to be on the lookout for toxic manifestations occurring as a result of the use of these preparations by both the physician and the public. While it is intended that the public be impressed with the fear of toxic reactions in order to avoid the baneful sequelae which might result from the indiscriminate use of the sulfonamides, on the other hand a thorough knowledge of what reactions to expect and the recognition of them will help dispel the fear of toxic effects on the part of the physician, thus giving him a feeling of greater security in the use of these valuable new chemotherapeutic agents. The physician's knowledge of the reactions and his early recognition of them will inspire greater confidence in the employment of these drugs and insure the patient the great therapeutic benefit to be derived from the use of the sulfonamides, when it is indicated, under properly controlled observation. The present discussion deals chiefly with the toxic cutaneous manifestations, with a brief reference to some of the other manifestations of toxicity and with the report of a case of toxic dermatitis together with the changes noted at autopsy.

The earliest toxic manifestations observed after use of the sulfonamides were referable to the nervous system and were thought to be the result of central action of the drugs; they consisted of dizziness, headache and ringing of the ears.[1]

It is important to determine, if possible, the patient's previous experience with sulfanilamide or its derivatives or whether an allergy exists to a group of drugs in general, such as arsenicals, bismuth compounds, the barbiturates or the coal tar analgesics.[1a]

From the Dermatologic Service of the Michael Reese Hospital.

1. Long, P. H., and Bliss, Eleanor A.: The Clinical and Experimental Use of Sulfanilamide, Sulfapyridine and Allied Compounds, New York, The Macmillan Compnay, 1939.

1a. Abramowitz, E. W., and Russo, J. J.: Fixed Eruption from Magnesium Hydroxide: Polysensitivity, Arch. Dermat. & Syph. **41**: 707 (April) 1940.

The toxic cutaneous reactions may manifest themselves as an angioneurotic edema, or as an erysipelas-like, an erythematous, a morbilliform or an erythema nodosum–like eruption.[2] Exfoliative dermatitis and petechial, purpuric or scarlatiniform eruptions also may be seen. The eruption may be localized or may involve the entire body and may or may not be accompanied by itching. Bullous eruptions and bullous stomatitis following therapy with sulfanilamide[3] have been reported, and the case here reported is that of a pemphigus foliaceus–like eruption occurring as a sequela to the use of sulfanilamide and its derivatives in the treatment of mastoid sepsis.

Epstein[3] stated: "It is interesting that sulfanilamide may lead to the development of tense bullae on apparently normal skin, in association with definite constitutional symptoms." He stated further that the individual bullae on the right hand and forearm of his patient were clinically indistinguishable from those seen in pemphigus. The appearance of the first bullae in the mouth in certain cases of pemphigus is well known to all who have observed this disease, and Loveman and Simon[4] reported a case of stomatitis due to sulfanilamide in which there was an associated bullous lesion on the thenar eminence.

From these reports it is evident that there is a similarity between certain elements in the syndrome of pemphigus and those occurring as a sequela to the administration of sulfanilamide for therapeutic purposes. It is, then, conceivable that a severe toxic reaction due to sulfanilamide may occur with generalized involvement of the skin simulating pemphigus, and in the case here reported a patient who had received large doses of sulfanilamide for mastoid sepsis subsequently showed a generalized malodorous dermatitis with exfoliation, the development of tense bullae on the trunk and extremities and a septic picture simulating that seen in pemphigus. We therefore feel justified in reporting this case as a pemphigus foliaceus–like toxic eruption following the administration of sulfanilamide.

REPORT OF CASE

A Jewish man aged 47 was admitted to the ear, nose and throat service of Michael Reese Hospital with acute otitis media and mastoiditis on the left side. He was treated conservatively on admission, then given sulfanilamide from November 18 to November 27, after which a generalized morbilliform eruption developed. On November 30, three days after the drug had been discontinued, the eruption had practically receded, and a simple mastoidectomy was performed. The patient was then transferred from the hospital to a convalescent home, and about December 18 a generalized malodorous dermatitis with exfoliation developed. He reentered the hospital and was transferred to the dermatologic service. He appeared acutely ill on admission, and his skin presented a generalized light brown pigmentation with large, flakelike, moist exfoliation superimposed. The room was permeated with a musty odor such as is frequently noted in the presence of pemphigus. He had a febrile course from December until May and received soothing local applications but no more sulfanilamide. During January and February the patient received a total of 500 cc. of human serum intravenously.

On January 27 the exfoliative process began to improve, and the improvement continued, so that on February 4 there was almost complete involution of the toxic cutaneous eruption, but the brown pigmentation remained. The patient was up and about during the middle of February, showing constant improvement in his physical condition, but during this period several bullae the size of a dime appeared on the right side of the chest near the nipple and on the right hip over the trochanteric area. These bullae ruptured, leaving raw, oozing surfaces. Subsequently, groups of bullae appeared over both midscapular areas, and new bullae appeared on the inner side of the right arm, on the wrist, on the midlumbar region and on the malleoli. The patient was in a denutritive state, and human serum and a 10 per cent solution of dextrose were administered intravenously. The patient was kept on supportive therapy and seemed to be following an uneventful course toward recovery, with a gain in strength and a desire for food; he

The Clinical Toxic Manifestations of Sulfanilamide, Sulfapyridine and Sulfathiazole with the Time of Their Appearance in the Course of Therapy

Toxic Manifestations	Sulfanilamide	Sulfapyridine	Sulfathiazole
Nausea and vomiting	Uncommon, occurs early	Very frequent, occurs early	Rare
Dizziness	Common, occurs early	Common, occurs early	Uncommon
*Psychoses	Rare, occurs early	Not reported	Not reported as yet
*Neuritis	Rare, generally early	Not reported	Not reported as yet
Cyanosis	Very common, occurs early	Faint; common; occurs early	Uncommon, occurs early
Acidosis	Common if sodium bicarbonate is not given, occurs at any time	Not reported	Not reported as yet
*Fever	Common, generally 5th to 9th day; may occur from 1st to 21st day	Uncommon, generally 5th to 9th day; may occur from 1st to 21st day	Common, 5th to 9th day
*Rash	Common; may take almost any form; generally 5th to 9th day; may occur 1st to 21st day	Not very common, generally 5th to 9th day; may occur 1st to 30th day	Very common, generally 5th to 9th day
†Hepatitis	Rare, early or late	Rare, early or late	Not reported as yet
*Hematuria	Not reported	Common, 1st to 10th day	Common, 1st to 10th day
†Anuria with azotemia	Not reported	Not uncommon, 2d to 14th day; blood pressure and fundi normal	Not uncommon
†Acute leukopenia with granulocytopenia	Not common 1st to 10th day	Common, especially in children; 1st to 10th day	Not uncommon, 3d to 10th day
†Agranulocytic angina	Uncommon, generally between 17th to 25th day; may occur 14th to 40th day	Uncommon, generally between 17th and 25th day; may occur 14th to 40th day	Not reported as yet
*Hyperleukocytosis	In presence of acute hemolytic anemia	In presence of acute hemolytic anemia	Not reported as yet
Mild hemolytic anemia	Very common, early and late	Common, early and late	Not reported as yet
*Acute hemolytic anemia	Common, especially in Negroes; generally 1st to 5th day	Uncommon, generally 1st to 5th day	Reported as occurring
†Purpura haemorrhagica	Rare	Rare	Not reported as yet
*Injection of scleras and conjunctivas	Not reported	Not reported	Common, especially in conjunction with rash and fever; 5th to 9th day
Visual disturbances	Rare	Rare	Not reported as yet
†Jaundice	With hepatitis or acute hemolytic anemia	Rare	Not reported as yet
*Painful joints	Reported	Not reported	Reported with rash
*Stomatitis	Rare	Not reported	Not reported
Gastrointestinal tract	Bleeding rare, diarrhea uncommon	Bleeding reported	Not reported

* Best to stop drug and force fluids. † Imperative to stop drug and force fluids.

2. Loveman, A. B., and Simon, Frank: Erythema Nodosum from Sulfanilamide, J. Allergy **12**: 28-33 (Nov.) 1940.
3. Epstein, Ervin: Bullous Eruption Following Sulfanilamide, Arch. Dermat. & Syph. **41**: 61-63 (Jan.) 1940. Loveman and Simon.[4]
4. Loveman, A. B., and Simon, Frank: Fixed Eruption and Stomatitis Due to Sulfanilamide, Arch. Dermat. & Syph. **40**: 29-34 (July) 1939.

was able to be up and about in his room May 20. The elevation in temperature suddenly recurred; examination of the chest revealed much moisture at the bases of the lungs, and the patient died that evening with severe dyspnea.

Autopsy was done by Dr. Otto Saphir, and the changes observed post mortem as reported by him were abscess of the lower lobe of the left lung, with peripheral bronchopneumonia and overlying adhesive pleuritis; bronchopneumonia and old adhesive and obliterative pleuritis of the right lung; tuberculosis (caseous and calcific) of the tracheobronchial lymph nodes; calcification of the mesenteric lymph nodes; brown atrophy of the heart; pulmonary emphysema and edema; diffuse hemorrhagic cystitis; severe cystitis cystica; chronic passive hyperemia of the liver and kidneys, fibrosis of the spleen; an extrarenal pelvis and extrarenal major calices in both kidneys; occlusion of the proximal part of the right ureter at the ureteropelvic junction; multiple, extensive decubital ulcers; meningeal hyperemia; a solitary hematoma of the liver, and a small hematoma in the submucosa of the small intestine.

With the extremely wide use of the sulfonamide compounds, it is natural that the reports of toxic eruptions should increase, and it is important that the variations of these toxic manifestations, as they appear on the skin, be well known to all who employ the drugs so that the incidence of progressive, lethal, toxic reactions will be reduced and that the physician will be aware of the early cutaneous manifestations of toxic reactions and thus stop giving the drugs in the early stages of these reactions before a profound change has occurred in the skin or the internal organs.

Geiling[5] has recently discussed the therapeutic applications of sulfanilamide and its allied compounds. At a lecture by Dr. Perrin Long, delivered in Washington, D. C., May 15, before the Pan American Scientific Congress, Long presented the résumé of clinical toxic manifestations as given in the accompanying table, which we have taken from Geiling's article.[5]

COMMENT

We agree with Maher,[6] who said: "We have here [in the sulfonamides] a group of drugs which have offered marvelous powers of healing in a group of infectious diseases for which we previously had little in the way of treatment—a group of drugs, however, which possesses a definite and poorly understood power to harm patient as well as organism, and concerning which much remains to be explained. It seems evident that sulfanilamide is still the drug of choice in streptococcal infections, with sulfapyridine of some value in both experimental streptococcic and staphylococcic infections, but primarily of value in the pneumonias. Preliminary work by Barlow and others justifies hope for clinical value for the thiazol derivatives in treating staphylococcic infections, and Dr. Gruhzit's preliminary paper ascribes promising value to the use of sodium paranitrobenzoate in treating Streptococcus viridans infections, at least experimentally. Considerable care and control in the handling and administration of these drugs is clearly necessary. It seems clearly apparent that continued cooperative effort between the clinician, the pathologist, the bacteriologist and the pharmacologist is necessary to the reduction of therapeutic accidents, as well as to the full realization of the clinical value inherent in the sulfonamides."

SUMMARY

A generalized type of cutaneous reaction following the use of sulfonamide preparations was seen. These drugs have great power to harm the patient, and there is a necessity for the trained user of them to recognize the varied cutaneous pictures which visibly indicate a toxic reaction, so that the physician may promptly stop the use of the drugs and prevent baneful sequelae. The toxic reactions other than cutaneous ones are not dealt with in this paper, although Long's summary of toxic manifestations, presented in tabular form, should be given consideration and study.

104 South Michigan Avenue.

5. Geiling, E. M. K.: Therapeutic Applications of Sulfanilamide and Allied Compounds, Illinois M. J. **78**: 404 (Nov.) 1940.
6. Maher, F. T.: The Chemistry of the Sulfonamides, Illinois M. J. **78**: 397 (Nov.) 1940.

Special Article

GLANDULAR PHYSIOLOGY AND THERAPY

THE PANCREAS AS AN ORGAN OF INTERNAL SECRETION

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AND
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This special article is published under the auspices of the Council on Pharmacy and Chemistry. It is one of a series which will be published in book form as the second edition of "Glandular Physiology and Therapy." The opinions expressed in this article are those of the authors and do not necessarily represent the views of the Council.—ED.

Removal of a dog's pancreas produces in that animal a series of metabolic changes which are strikingly similar to those of severe diabetes mellitus in human subjects. No less definite is the speedy elimination of these abnormalities in both the depancreatized dog and the patient with diabetes following the injection of insulin, which is obtained from normal pancreatic tissue. The observations on the effects of pancreatectomy, made by von Mering and Minkowski,[1] and those on the effect of insulin on depancreatized dogs, made by the group in the department of physiology of the University of Toronto,[2] provided very good evidence for the association of the pancreas and its internal secretion with the condition of diabetes. These salient facts have been added to extensively during the last few years. Some of the additions have established older views more definitely, whereas some have led to entirely new conceptions of the cause of diabetes mellitus and the action of the antidiabetic hormone.

Thus, pancreatectomy in the dog is followed by glycosuria and ketonuria; the cat similarly treated shows these signs to an even greater extent, while in certain other animal species investigated recently (pig, monkey and goat) these symptoms are much milder. Depancreatized monkeys and goats and certain depancreatized birds have been maintained alive for long periods without administration of insulin. Again, it is now well known that hypophysectomy in the depancreatized dog or cat causes an appreciable reduction in the metabolic rate of these animals, accompanied by a considerable decrease in the intensity of diabetes. It is probable that the mildness of the disease in the aforementioned species may be attributable to the lesser activity of their pituitary glands. Extracts of the anterior lobe of the pituitary gland injected into dogs and cats often produce severe, permanent diabetes.[3] So far there has been no clearcut indication that diabetes mellitus is due to overactivity of the pituitary gland, but the more frequent incidence of this disease among acromegalic persons constitutes circumstantial evidence in favor of this view.

From the Department of Physiology, University of Toronto.

1. von Mering, J., and Minkowski, O.: Diabetes mellitus nach Pankreasextirpation, Arch. f. exper. Path. u. Pharmakol. **26**: 371, 1889.
2. Banting, F. G., and Best, C. H.: The Internal Secretion of the Pancreas, J. Lab. & Clin. Med. **7**: 251 (Feb.) 1922.
3. Young, F. G.: The Pituitary Gland and Carbohydrate Metabolism, Endocrinology **26**: 345 (Feb.) 1940.

The diabetic state, therefore, may not be due primarily to subnormal secretion of antidiabetic hormone but to various other hormonal disturbances, especially of the pituitary and the adrenals.

If the pancreas is removed from a dog, the animal is unlikely to survive for two weeks, even with the greatest care, unless insulin is administered. With this hormone a rapid recovery from the operation is obtained and, provided the diet is satisfactory (see later comment on this), the animal soon appears to be normal and may be maintained so for several years. If insulin is withheld, however, certain characteristic symptoms soon become evident. The concentration of sugar in the blood increases progressively, even in the fasting animal, until it may be several times that of the normal value of 0.07 to 0.10 Gm. per hundred cubic centimeters. Consequently, dextrose may now be detected readily in the urine, often in considerable amounts. The qualitative test for sugar in the urine as ordinarily carried out with Benedict's reagent is often positive owing to the presence of "non-sugar reducing substances." To be sure that sugar is present, one of the several methods of estimating "true sugar" should be employed. Soon, too, "acetone bodies" may be detected, and these substances gradually increase in amount. The amount of nitrogenous substances in the urine increases. These changes depend on a number of factors, including the nature and quantity of the diet.

Two criteria which have been much in evidence in the metabolic study of the diabetic condition, and since the discovery of insulin, in the study of its action, are the D:N (i. e., dextrose:nitrogen) ratio and the R. Q. (respiratory quotient). The dextrose:nitrogen ratio characteristic of the completely depancreatized animal (i. e., depancreatized dog) receiving no food or insulin was considered to be 2.8:1. There is little reason in continuing to accept this fixed value for the ratio, for it varies considerably in different animals and in the same animal at different times. With respect to the respiratory quotient, it is conceded that in the patient with severe diabetes and in the depancreatized dog or cat it has a low value of about 0.7, while after the injection of insulin it may be appreciably raised. It provides a useful index for comparing or contrasting the state of animals under similar or different conditions. But the exact interpretation of the figures is generally appreciated to be uncertain, for they are composite figures, due to metabolic changes whose type and extent investigators have no way at present of determining accurately.

Much of present knowledge of the part played by insulin has been obtained from studies of the blood sugar and of quantitative variations in its concentration. It is therefore of prime importance to appreciate what is known about this essential metabolite. The concentration of sugar (dextrose) in the blood is dependent on the rate at which it is being added to the blood and the rate at which it is being removed. This perfectly obvious view has often been overlooked, more particularly by those who have made unwarranted interpretations of dextrose tolerance curves. In the postabsorptive state the sole source of the blood sugar is the liver. The sugar is obtained by hydrolysis (glycogenolysis) of the hepatic glycogen, which may be synthesized (glycogenesis) from ingested sugar, which usually is dextrose but which may also be fructose, usually from cane sugar, or galactose, from milk sugar. It was formerly believed that these enzymic changes which one may write glycogen $\rightleftarrows$ dextrose were mediated by an amylase. For long the close relationship between phosphate metabolism and carbohydrate metabolism has been recognized. As a result of recent work by Cori[4] and others, it now appears that the aforementioned reactions involve enzymes concerned with phosphorylation processes. The glycogen is also synthesized from dextrose derived (glyconeogenesis) from certain of the amino acids (the so-called glycogenic amino acids, aminoacetic acid, alanine, cystine, proline, hydroxyproline, norleucine, serine, arginine and aspartic, glutamic and betahydroxyglutamic acids). Theoretically, dextrose might also be derived from fatty acids, but a satisfactory proof of hepatic conversion of fatty acids, except perhaps butyric acid, to sugar has not yet been given. One may regard all the extrahepatic tissues, especially the muscles and the brain, as withdrawing sugar from the blood continually. In the fasting animal at rest the liver is continuously secreting dextrose at a constant rate (studies on hepatectomized dogs indicate that in this species the rate of secretion is about 0.25 Gm. per kilogram of body weight per hour). Any extra activity of the animal calls forth an increased supply of sugar from the liver. If in spite of the increased secretion the rate of uptake increases more rapidly, hypoglycemia will result. This state may be observed in long distance runners or others engaged in prolonged physical exertion. When carbohydrate food is eaten, and the sugar is being absorbed from the intestine into the blood stream, the liver ceases to secrete sugar, the intestinal supply satisfies the energy demands of the tissues, while the excess of sugar is deposited as glycogen in the muscles as well as in the liver. The hepatic supply of glycogen is thus replenished, and when most of the sugar has been absorbed from the intestine and the blood sugar has returned to its normal value, the liver once again supplies sugar to the blood at a rate proportional, within limits, to the immediate necessities of the animal. Recently, strong support for this homeostatic mechanism of the liver has come from the researches of Soskin and co-workers.[5] In the diabetic state the amount of glycogen retained in the liver (and muscles) even immediately after a meal is small, but the secretion of sugar by the liver continues to be greater than usual, for the rate of glyconeogenesis is increased above the normal. This is reflected in the increased nitrogen excretion and also in the rapid loss of weight of the animal. In the diabetic condition the metabolic rate is raised.

Much debate has been made as to whether the diabetic condition is characterized by an overproduction or by an underutilization of sugar. There is now no doubt that the completely diabetic patient is able to oxidize dextrose, and because of the increased concentration of sugar in the tissues, the amount of dextrose oxidized may not be much short of that which the animal would use under normal conditions, with a normal concentration of blood sugar. There is also no doubt that an appreciable overproduction of sugar by the liver occurs. We take the position that both overproduction and underutilization play a role in the diabetic state.

4. Cori, C. F.: Glycogen Breakdown and Synthesis in Animal Tissues, Endocrinology **26**: 285 (Feb.) 1940.

5. Soskin, Samuel: The Liver and Carbohydrate Metabolism, Endocrinology **26**: 297 (Feb.) 1940.

The disturbed metabolism of fat in the depancreatized animal is indicated by an increase of fatty substances in the blood: neutral fat, cholesterol esters and phospholipids. Presumably, these reflect an increased rate of mobilization of depot fat. The extent of these changes is dependent on the presence or absence of certain dietary factors (see later comments on this). Further evidence of the disturbance in fat metabolism is the development of ketosis.

Ketosis is a well recognized condition in the diabetic patient and in depancreatized animals of certain species. The condition is manifested by the presence in the blood and urine of abnormal amounts of "acetone bodies" (acetone, acetoacetic acid and betahydroxybutyric acid). Methods are available for the estimation of each of these constituents or for the combined estimation of all three (and this is the information usually sought). Although the amounts of these substances normally present in the blood are very small—so small as to be just detectable by sensitive methods—it seems justifiable to regard them as normal metabolites. They are produced in the liver. They may be formed from certain of the amino acids (the "ketolytic" amino acids, tyrosine, leucine, isoleucine and phenylalanine) and from fatty acids. We know that these "acetone bodies" are formed in greater amounts at times when there is reason to believe that oxidation of fat is providing much of the body's energy requirements. It was generally taught that their production at such times is due to the absence of oxidation of carbohydrate. Carbohydrates were thus regarded as antiketogenic substances, but there is now much to commend the teaching that carbohydrates are antiketolytic; that in the absence of carbohydrate, if fat is available, more fat is used, with a consequent increase in the production of "acetone bodies."

The ketosis in a depancreatized fat dog is greater than that in a lean one, but this species is characterized by its efficiency in metabolizing fats without ketosis. The loss of body fat is rapid, but the ketosis may be so severe even in this species that severe acidosis develops and the dog dies in coma before the fat reserves are depleted. The toxic enolic form of acetoacetic acid, $CH_3COH = CH.COOH$ (and other substances containing the enolic grouping $C.OH = CH$ are said to act likewise), is reported to stimulate the respiratory center and to depress the higher centers of the brain, so causing "air hunger" and the dimmed perception and loss of consciousness of diabetic coma. But the evidence does not justify the conclusion that acetoacetic acid is the sole cause of this syndrome.

CHEMISTRY OF INSULIN

The active material is a protein. It may be regarded as an albumin. By the Svedberg ultracentrifuge method it has a molecular weight similar to that of egg albumin, namely, 35,000. It now can be readily crystallized,[6] usually in the form of twin rhombohedra of microscopic size, a little above its isoelectric point, provided salts of zinc, nickel, cadmium or cobalt are present in the solution. These metals are evidently linked chemically with the protein in its crystalline state, for they occur in constant amounts and these amounts are proportional to their atomic weights. Zinc is present in zinc insulin crystals to the extent of nearly 0.5 per cent. The fact that normal pancreatic tissue is relatively rich in zinc may be of some significance in the storage of the hormone in the gland. The protein has a high sulfur content (3.2 per cent), all present in the form of cystine. The molecule contains no carbohydrate material, and apart from its low mineral content, appears to be wholly constituted of amino acids. The constituent amino acids and their percental distribution have been reported as leucine 30, glutamic acid 21, cystine 12, tyrosine 12, proline 10, histidine 4, arginine 3, lysine 2, phenylalanine 1. The figures should perhaps be regarded as indicating the relative amounts rather than the exact amounts of the different amino acids.

Slightly acidified insulin has been kept for long periods, but in dilute alkali insulin is relatively unstable. It is hydrolyzed and so is rendered physiologically inactive by those enzymic preparations which attack proteins. Thus, trypsinogen is without effect on insulin, and a portion of pancreas may be incubated at 37 C. for some hours without any alteration in the amount of insulin which can be extracted from it. Various attempts have been made to ascertain if there is in the molecule a specific grouping of certain of the amino acids which is really responsible for its hormonal activity. It may be concluded that the physiologic activity of insulin may be slightly and sometimes reversibly decreased by certain minor chemical changes in the molecule, whereas appreciable chemical alteration gives a considerable diminution or complete absence of activity. These considerations are linked with the fate of insulin in the animal body after secretion from the pancreas or after parenteral injection. Proteases of the blood and other tissues may effect considerable destruction. Other changes have been suggested, such as the action of sulfhydryl groupings, as in glutathione, which may reduce the cystine disulfide linkage, a change which is known to be accompanied by inactivation.

INSULIN STANDARD

Zinc insulin crystals from all sources so far examined (man, cattle, hog, sheep, bison, fish) have the same potency. Very recently, preparations of zinc insulin crystals have been made of slightly greater potency than usual. This work may have considerable theoretic interest. The international standard, a preparation of zinc insulin crystals, is defined as containing 22 units per milligram. There are two well established methods of assaying the potency of an insulin preparation. The lowering of blood sugar in fasting rabbits and the production of convulsions in fasting mice furnish satisfactory effects of insulin for the comparison of unknown and standard products.

SOURCE OF INSULIN

The pancreas appears to be the only organ which makes and stores the antidiabetic hormone in detectable amounts. The hormone has also been demonstrated in blood, but this has been done, not by extraction procedures, but by passing the blood into another test animal.

The islet cells of the pancreas are of three types: α, β and a more ill defined type called D cells by Bloom. In dog pancreas the number of cells per islet varies greatly, as do the relative numbers of the three types of cells. One study gives the average number per islet as 30 and the average ratio of α, β and D cells as

6. Scott, D. A.: Crystalline Insulin, Endocrinology **25**: 437 (Sept.) 1939.

20:75:5. The islet volume may be about one one-hundredth of the pancreas. The β cells occupy the periphery of the islets and are smaller than the others. It is these cells which are considered to be producers of the antidiabetic hormone; indeed, the granules of these cells may consist largely of this substance. Epithelial cells of the small ducts are considered to be the "mother cells" of the islet and acinar cells. New islet cells may therefore be produced from them. It may be mentioned here that in no frank uncomplicated case of diabetes mellitus has there appeared to be complete recovery of islet function. Although earlier claims of the demonstration of a pancreatropic principle in the pituitary have been questioned, recent research indicates the presence in anterior lobe extracts of a pancreatic stimulant. Thus the pancreases of dogs receiving these extracts show at certain times not only degenerative changes in islet cells but also obvious proliferation of new islet tissue. Certain strains of rats similarly treated show no degenerative changes but a definite increase in islet cells.

The main points of evidence which indicate that the hormone is produced in the islet cells are as follows: 1. Histologically, the islets are glandular structures, the obvious outlet for the secretion of which is through the blood stream. 2. There are relatively large amounts of the hormone in the principal islets of teleosteal fishes, in which few enzyme-producing cells are found. 3. The active substance is found in degenerated pancreas in which the loss of acinous tissue has proceeded more rapidly than that of the islet cells. Ligation of the pancreatic ducts eventually produces a decrease in the insulin content of the pancreas, but moderate amounts of insulin may still be extracted when very few enzyme-producing cells remain. 4. When most of the pancreas, approximately nine tenths, is removed from a dog, characteristic lesions (hydropic degeneration) are found in the β cells of the remnant. These changes can be accelerated by a high carbohydrate diet, and prevented or eliminated by administration of insulin or by fasting. 5. The clinical condition known as hyperinsulinism occurs when the pancreas liberates abnormally large amounts of antidiabetic hormone. In many of the cases there are definite tumors of the islet cells. After operative removal of these masses of islet cells the blood sugar is maintained at higher levels. 6. Metastases in other tissues arising from carcinoma of the islet cells have been shown to contain insulin. 7. The injection of anterior pituitary extracts leads to destructive changes in the islet cells, chiefly in the β cells, while there is little or no effect on the α cells. The pancreases from a number of dogs treated with these extracts have been assayed for their insulin content, and the values obtained were roughly proportional to the β cell concentration in histologic sections of these glands.

THE INSULIN CONTENT OF THE PANCREAS UNDER DIFFERENT CONDITIONS

The insulin content of the pancreas under widely different conditions and in various animal species has been extensively studied. The insulin is obtained from minced pancreases with an acid aqueous alcohol solution, from which certain contaminating material is removed before precipitating the active material, which is then redissolved and estimated by the mouse method of assay. In the dog, the insulin content of the free splenic end of the pancreas is greatest, that of the attached duodenal portion has an intermediate value, while that of the free duodenal end is lowest, the values being about 4, 3 and 2 units per gram, respectively. It might be mentioned here that the size of the pancreas in the dog, at least, bears no strict relationship to the weight of the animal. In partially depancreatized dogs, provided sufficient pancreas is left to prevent the onset of diabetes, the insulin content does not differ from that of the corresponding part in a normal dog, nor are any degenerative changes in the β cells noted, whereas, if diabetes supervenes, hydropic degeneration of these cells is observed, and the insulin content of the remnant of pancreas becomes extremely small. The daily injection into dogs of diabetogenic extracts from the anterior lobe of the pituitary gland produces a prompt and profound decrease in the insulin content of the pancreas (in seven days to 0.2 unit per gram). If administration of the extract is discontinued at this stage, the normal insulin content is restored within four days, whereas continued administration of extract reduces the insulin content to negligible amounts, and no subsequent recovery occurs. Simultaneous administration of insulin prevents or greatly modifies the fall in the insulin stores. The latter fact strongly suggests that the β cells are permanently damaged by the extract through overwork and that the simultaneous administration of insulin relieves the cells of some of this excessive demand for the hormone.

The injection of anterior pituitary extracts into certain strains of rats does not cause a diabetic condition. Instead the insulin content is increased, as is also the islet count. Starvation (seven days) or a diet rich in fat produces a decrease in the insulin content of the rat pancreas to about half its normal value, which is about 2½ units per rat. These animals have their insulin stores speedily restored to normal (in six days) when they are returned to a balanced diet; carbohydrate alone effects a partial restoration. Daily injection of insulin into rats causes an even more marked decrease in the insulin content of the pancreas than does starvation. In this connection it is interesting to note the earlier report that injection of insulin inhibited the proliferative activity of the islet cells of young rats. Also feeding of a high fat diet to trout is said to lead to degenerative changes in the islets. No marked histologic changes were noted in the islets of the rats on the high fat diet.

The effect of age on the insulin content of the pancreas has been studied in the cow. In fetal calves under 5 months the pancreatic content was 34 units per gram; in calves 6 to 8 weeks old, 10 units per gram; in heifers 2 years old, 5 units per gram; in cows 9 years old and older, 2 units per gram. Pregnant cows 7 years old and older showed no change from the normal insulin content of 2 units per gram. Here it may be mentioned that the decrease in insulin requirements frequently noted at certain stages of pregnancy in the diabetic woman has not been clearly shown to be due to the passage of antidiabetic hormone from the fetus to the mother. What seems likely is that extra sugar may pass from the mother to the fetus as a result of excessive stimulation of the fetal pancreas. The changes may also be due directly to the considerable hormonal activity of pregnancy.

Pancreases obtained from nondiabetic persons post mortem have an average insulin content of about 2 units per gram; those of diabetic persons show wide varia-

tion, the average content being 0.4 units per gram. The insulin content of a tumor of islet tissue surgically removed from a patient suffering from hyperinsulinism was as high as 85 units per gram.

It is, of course, apparent that these "insulin contents" indicate the balance between the rate of production of the hormone in the islets and the rate of liberation. There is no reason to doubt that under different conditions these rates may vary considerably and in either direction. The tentative conclusion has been drawn from some of these results that the islet cells are "rested" by administration of insulin, by starvation and by a high fat diet; that in these conditions less insulin is excreted by the pancreas than under normal conditions.[7] Partial pancreatectomy, sufficiently extensive to result in diabetes, and administration of diabetogenic extracts cause marked stimulation of the islets and, because of this "overwork," they degenerate.

SECRETION OF INSULIN

Nerve endings of the vagus have been located in the β cells of the islets. There is reason to believe that the nervous control plays a minor role in secretion, and certainly secretion of insulin has been demonstrated in denervated pancreatic transplants. It is generally believed that the rate of secretion of the antidiabetic hormone is regulated by the concentration of dextrose in the blood passing through the pancreas. Other substances may play a part in this regulation, possibly the antidiabetic hormone itself; at certain concentrations in the blood it may inhibit further secretion by the β cells. Houssay [8] obtained a lowering to normal of the blood sugar of a depancreatized dog by means of a pancreatic transplant; the transplantation of three more pancreases produced no further effect. When sugar is fed to an animal, the resulting hyperglycemia evokes increased secretion of insulin, which prevents the continued increase of the blood sugar and ultimately is responsible for the return of the sugar to the normal value, at which time the secretion of insulin returns to its former rate. It has been maintained that the pancreas secretes the hormone continuously at a constant rate, and that the dextrose tolerance curve is determined by a change in activity of the liver as already discussed. A more satisfactory interpretation of known facts can be made if these two views are amalgamated: the concentration of blood sugar is controlled by supply or withdrawal of sugar on the part of the liver and by changes in the rate of secretion of insulin on the part of the pancreas.

It has been claimed by a number of investigators that the duodenal mucosa possesses a hormone (incretin or duodenin) which lowers the blood sugar by its supposed stimulation of the islet cells to secrete insulin. The presence of such a hormone has been rendered extremely doubtful by the recent work of Ivy and co-workers,[9] who further offered a critical analysis of the earlier experimental findings.

Interesting studies have been made of the insulin requirements of depancreatized dogs under different conditions. Thus the blood sugar has been kept at a normal level by simultaneous and continuous intravenous injection of insulin and dextrose solutions. The insulin required was between 0.06 and 0.4 units per kilogram per hour, while the corresponding requirement of dextrose was 0.2 to 0.6 Gm. per kilogram per hour. The higher values for insulin and dextrose were those required by unanesthetized dogs; the others, by anesthetized dogs. In another study the amount of insulin necessary to keep the blood sugar at a normal value in depancreatized dogs under basal conditions was between 0.005 and 0.035 unit per kilogram per hour, with an average value of 0.017 unit per kilogram per hour. The duration of action of insulin is not proportional to the size of the dose injected but is a simple function of the logarithm of the dose; i. e., insulin is inactivated in the body at a rate proportional to the amount in the body at the time. Thus if 1 unit lasts four hours, 10 units would last eight hours.

ADMINISTRATION OF INSULIN

Overdosage of insulin or spontaneous secretion of the hormone in excessive amounts is followed by a series of subjective sensations which have been frequently described. Objective signs are also evident in man and in animals, becoming progressively more alarming and finally giving way to convulsions or coma. This train of symptoms runs parallel to the progressive decrease in the concentration of the blood sugar. With certain species, e. g., dogs and rabbits, the convulsions may be severe and prolonged before coma ensues, while with other species, e. g., man and rats, the convulsions may be relatively mild, the comatose state quickly supervening. The physiologic mechanisms involved in these changes have yet to be elucidated; certainly the central nervous system is involved, for convulsions are annulled by general anesthesia, and they do not appear in spinal preparations. There is no good evidence to support older views that these symptoms depend on an accumulation of certain substances, toxic or otherwise. At present it may be said that these symptoms are associated with, and induced by, the low concentration of dextrose. It may be mentioned that under most circumstances the extreme condition of convulsions or coma does not occur until the concentration of blood sugar is extremely low or even zero. It will be remembered that many of the methods used to estimate blood sugar are not specific, and the values obtained are too high owing to the presence of "non-sugar reducing substances." In the diabetic patient and the depancreatized animal the convulsive level of the blood dextrose is frequently much higher than in the normal subject. But the onset of convulsions, with respect to the concentration of blood dextrose, depends on a number of factors. If the blood sugar is lowered rapidly, the convulsive symptoms may appear at a somewhat higher concentration of dextrose, while a very gradual lowering may be made to what ordinarily would be the convulsive level without convulsions or coma. If the patient or animal remains in this state for some time and convulsions finally occur (and they may be precipitated by relatively slight stimuli, such as a noise or a touch), they are often very severe, and restoration by administration of dextrose is much slower than when convulsions result from a speedy lowering of the blood sugar. This fact is of some consequence in the treatment of diabetic patients with protamine zinc insulin. It has been reported that rats are much more sensitive to insulin (as judged by the speedy production and

7. Haist, R. E.; Campbell, J., and Best, C. H.: The Prevention of Diabetes, New England J. Med. **223**: 607 (Oct.) 1940.

8. Houssay, B. A.: Diabetes as a Disturbance of Endocrine Regulation, Am. J. M. Sc. **193**: 581 (May) 1937.

9. Loew, E. R.; Gray, J. S., and Ivy, A. C.: The Effect of Duodenal Instillation of Hydrochloric Acid upon the Fasting Blood Sugar of Dogs, Am. J. Physiol. **126**: 270 (June) 1939.

severity of the hypoglycemic reactions) under reduced barometric pressure (460 mm. of mercury) than under normal pressures.

The term "hyperinsulinism" should be reserved for those cases in which there is excessive secretion of insulin, usually the result of a tumor of the islet cells, though in some instances it is due possibly to general hyperplasia of the islet tissue. It is by no means easy to prove that a given condition is one of hyperinsulinism. Even alleviation of the condition by surgical removal of a large part of the pancreas does not necessarily prove the point. The same result would have been secured if the hypoglycemia had been due, for example, to diminished secretion of the anterior lobe of the pituitary, for it has been shown that the hypoglycemia produced experimentally by extirpation of the anterior lobe of the pituitary may be alleviated by complete removal of the normal pancreas.

Very large doses of insulin can be given without apparent damage to animals of different species, provided they eat to the capacity of a normal hungry animal, otherwise frequent parenteral injection of small doses of dextrose are necessary and sufficient.[10] There appears, however, to be a limit to the tolerance for insulin even when hypoglycemia is prevented, but for most persons this is extremely high. Some have withstood the injection of very large doses, up to 1,000 or more units of insulin. In the treatment of schizophrenia the use of insulin in sufficient amounts to produce coma appears to depend on the prolonged marked hypoglycemia, which results in a curtailment of the energy supply of the brain. The use of insulin in other nondiabetic persons (those with tuberculosis, digestive disorders or malnutrition) depends on its stimulation of the appetite. Many persons seriously underweight before treatment have been brought relatively quickly to their normal weights. The increase in gastric motility and secretion following the administration of insulin was considered to be wholly due to the induced hypoglycemia, but there is now reason to believe that this is only part of the mechanism, for these effects of insulin are abolished by vagotomy. It has been well established that the administration of insulin to nondiabetic persons is followed for some time by a lowered tolerance for dextrose. This is probably due to suppression of the secretion of insulin by the subject's pancreas.

MODE OF ADMINISTRATION

A considerable advance in insulin therapy was made by the combination of insulin with protamine. The method was further perfected by the discovery that the addition of a small amount of zinc salt not only prolonged the effectiveness of the insulin but also stabilized what was otherwise a troublesome mixture to administer. Whereas solutions of zinc insulin crystals are rapidly absorbed from the subcutaneous tissues, preparations of protamine zinc insulin, having but slight solubility in the tissue fluids, are absorbed from the site of injection much more slowly, thereby simulating more closely the secretion of the normal pancreas. The following substances among others have also been added to insulin, and a delayed action of the hormone noted: zinc salts, spermine, arginine, thymus extract, alum, globin and hexamethylenetetramine.

Studies continue to be made on the problem of the administration of insulin other than by parenteral injection. In the main, efforts have been made to combine insulin with various materials, dyes, phenolic substances, tannic acid and others, which will protect the protein molecule from destruction by the intestinal enzymes when the hormone is given by mouth. The difficulties involved are obvious, and it is therefore not surprising that, while some success has attended these efforts in the laboratory, no satisfactory application to the treatment of diabetic patients has yet been made.

ALLERGY

Mild local reactions at the site of injection of insulin are not uncommon, while several local reactions and even generalized anaphylactic reactions have been reported occasionally. With the progressive purification of insulin preparations, allergic reactions have become much less frequent. Often the use of insulin from another animal source (insulin is available from cow, pig and sheep) eliminates or greatly modifies the reactions, though occasionally even preparations of zinc insulin crystals from a different source are not without local effect. Troublesome local reactions are said to have been observed with protamine zinc insulin in patients unaffected by the commercial brands of unmodified insulin. It might be mentioned that protamine is regarded as one of the nonantigenic proteins.

Recently claims have been made of successful active sensitization of guinea pigs with insulin. Zinc insulin crystals were used in some of these studies.[11] These findings raise a number of interesting points which may lead to results of fundamental importance. It has been supposed that hormones are identical in different species. Of the possible explanations of the apparent antigenicity of insulin preparations, the most obvious, perhaps, is that in spite of crystallization there may be present a minute amount of contaminating material which is actually responsible for the sensitivity reactions, or that in the process of isolation insulin has been altered in some way so as to render it a "foreign protein," unless one accepts the view that insulins from different biologic sources have certain differences in chemical structure, revealed by the delicate test of anaphylaxis.

THE MODE OF ACTION OF INSULIN

Of recent years several investigations have been published demonstrating in vitro actions of insulin in various minced or sliced animal tissues or cell-free extracts of them. Various interpretations have been placed on some of the findings.

Some have supposed, though on no very secure basis, that the carbohydrate substance which is oxidized in the animal body is glycogen rather than dextrose. Certainly insulin is concerned with the supply of glycogen, for, as already mentioned, in the depancreatized animal there is marked depletion of glycogen in the muscles (except the cardiac muscle, which shows an increase over the normal) and especially in the liver. A certain limited synthesis of glycogen in the liver and muscles has been shown in depancreatized dogs deprived of insulin for a few days. But, for a restoration to normal values, insulin is necessary. It has been debated whether insulin stimulates glycogenesis or inhibits glyco-

10. Allen, F. M.: Diabetic Experiments, Tr. A. Am. Physicians **53**: 320, 1938.

11. Harten, M., and Walzer, M.: Allergy to Insulin, Liver, Pituitary, Pancreas, Estrogens, Enzymes and Similar Substances, J. Allergy **12**: 72 (Nov.) 1940.

genolysis. It may well be that insulin exerts both of these effects under different conditions. When insulin is injected into a normal animal, there is a decrease in the concentration of blood sugar. Presumably some of the sugar which is removed is converted to muscle glycogen. The synthesis of muscle glycogen is easily demonstrated if sugar is also given. While insulin increases the deposition of hepatic glycogen in the diabetic animal, when it is given to a normal animal receiving sugar at the same time, the amount of glycogen stored in the liver is less, and may be considerably less, than when sugar is given without insulin. This well established fact should be borne in mind when for any reason it is necessary to build up rapidly the hepatic glycogen stores in the nondiabetic subject. There is no reason to doubt that considerable amounts of sugar (either as dextrose or as glycogen) are oxidized in the body in the absence of insulin. Insulin in conjunction with other substances appears to fulfil the role of arbitrator as to the relative amounts of the different sources of energy—carbohydrate, fat and protein—which shall be oxidized, and also as to the extent of the interconversion of these materials. If one were obliged to name the organ in which insulin exerts the most potent influence, there would be little hesitation in selecting the liver. In this connection the anatomic position of the liver with respect to the pancreas may be of considerable significance. It is true that so far no one has been able to demonstrate any difference in effect when insulin is injected into the portal system and when it is injected elsewhere in the body, but the relatively big doses used in comparison with the slow secretion of insulin by the pancreas may have masked the effect of the normal distribution of insulin. It is suggested, then, that the liver in the normal animal obtains a disproportionately large share of the secreted insulin. Not only do many chemical changes take place in the liver, but the extent of some of these changes is very great, which is more fully appreciated when one recalls that the liver alone is said to account for about one third of the total metabolic rate of the body. When the insulin supply is deficient, the rate of glyconeogenesis in the liver is increased. Administration of insulin decreases the production of sugar from amino acids, presumably by its effect on the deamination system. As has been already indicated, the production of sugar from fat is still hotly debated. Insulin exerts its effect also on other tissues. Thus the normal usage of sugar by the muscle is dependent on the correct supply of insulin. Mirsky has suggested that insulin has another effect on muscle metabolism in that it appears to increase the rate of the utilization of amino acids by the muscles for the synthesis of proteins.

The injection of insulin into a diabetic animal decreases the lipemia and cholesteremia. It would be unwarranted to presume that therefore insulin directly controls the mobilization of lipids and cholesterol. Again, an injection of insulin into a normal or a diabetic animal is followed by changes in the concentration of various other blood constituents. Perhaps the best known changes are the decreases in the inorganic phosphate and different nitrogenous substances, such as amino acids, urea, creatine and creatinine. In part these changes are regarded as secondary to hypoglycemia and due to the consequent liberation of epinephrine. This is so, but insulin itself can bring about these changes. Various changes in the concentration of the metallic constituents of the blood have been reported. It would appear that some of these changes, especially that of the concentration of potassium, point to a fundamental relationship between electrolytes and carbohydrate metabolism.[12]

To summarize this discussion on the action of insulin it may be stated that the hormone (1) decreases glyconeogenesis from protein, (2) encourages the formation of glycogen, (3) increases the combustion of carbohydrate, (4) decreases the insulin content of the pancreas in the fed or the fasting animal and (5) protects the islet cells, probably by preventing overstrain.

INSULIN RESISTANCE AND SENSITIVITY

These terms are used to describe vastly different conditions. Thus the term "insulin resistant" is applied to the so-called adult type of diabetes, as opposed to the juvenile type of diabetes referred to as "insulin sensitive." It is also applied to the alteration in the diabetic state due to infection or to diabetic coma. It is obvious that the terms bear no rigid connotation. Again, the administration of thyroxin is said to increase "insulin resistance." This is only partially true, for continued administration of thyroxin until the hepatic stores of glycogen become very meager brings on a state of "insulin sensitivity." In comparing the effect of insulin under different conditions—even in the same animal—different results may be obtained, depending on the particular criterion employed in the comparison. A dog that has been starved for a long time will deposit much less hepatic glycogen after an injection of dextrose and insulin than a dog that has fasted for a short period. One might therefore conclude that the animal is insulin resistant in its starved condition. However, if the change in blood sugar is used as the criterion, this is not necessarily the conclusion. Chambers has shown that while the absolute decrease in the concentration of blood sugar due to the injection of insulin is less in the starved than in the normal condition, the percental decrease based on the initial concentration during fasting is the same. The following tabulation lists the conditions and substances which are considered to influence the response to insulin and should be liberally interpreted in the light of the aforementioned qualifications.

Resistance to Insulin	Sensitivity to Insulin
Diet	Diet (e. g., addition of vitamin B_1, addition of sodium chloride)
Infections	
Allergic reactions	
Coma accompanied by acidosis	von Gierke's disease
Hyperthyroidism (thyrotoxicosis)	Sympathectomy
Hyperpituitarism (acromegaly)	Hypothalamic lesions (occasionally)
Glycotropic principle of anterior pituitary extracts	Hypopituitarism (hypophysectomy)
Diabetogenic principle of anterior pituitary extracts	Adrenal insufficiency
Posterior pituitary extracts	Adrenal denervation
Epinephrine	
Steroids of the adrenal cortex	

INSULIN SUBSTITUTES

Much experimental work continues to be done in efforts to obtain a substitute for insulin, preferably one which will be active when given by mouth. Numerous

12. Fenn, W. O.: The Rôle of Potassium in Physiological Processes, Physiol. Rev. **20**: 377 (July) 1940.

plant extracts have been tried, and with some a lowering of the blood sugar has been noted. Several derivatives of guanidine have also been tried, perhaps the best known being decamethylene diguanidine. This substance does not increase deposition of muscle glycogen and its effect on hepatic glyconeogenesis is accomplished in a highly unphysiologic manner—by damaging the liver. Other substances besides this substance interfere with sugar formation in this manner. It is preferable for the diabetic organism to excrete the large quantities of dextrose made by a relatively healthy liver than to be made "sugar free" by damaging the liver so that less dextrose is formed.

THE QUESTION OF A SECOND INTERNAL SECRETION OF THE PANCREAS

It has been claimed by various research workers that there is evidence for the production of an internal secretion by the α cells of the islands of Langerhans. Extracts purported to consist largely of substances obtained from the α cells are believed to exert an effect on fat metabolism. These results raise an interesting point but cannot at present be regarded as convincing.

Dragstedt and collaborators have published in a series of articles results which they believe demonstrate the existence of a new pancreatic hormone which they have named lipocaic. This substance prevents deposition of fat in the livers of depancreatized dogs under certain conditions. They have shown that the active substance of this extract is not choline, which had been previously proved, by the Toronto group, to exert similar effects. Some investigators have secured evidence which supports Dragstedt's conclusions, and others have challenged his interpretations.[13]

New light has been thrown on this problem by our colleagues McHenry and Gavin, who have obtained definite evidence that the pancreatic extract lipocaic and other materials, such as rice polish concentrate and yeast, do contain a *dietary factor* which is quite distinct from choline. This active material prevents the fatty change of the liver produced in rats by certain liver extracts (Blatherwick and co-workers) under conditions in which choline is ineffective.

The situation with regard to the pancreas at present is, therefore, that it has been shown to contain a dietary factor or factors other than choline and that the one of these which affects liver fat in rats is present also in rice polishings and yeast. This unidentified dietary factor may or may not prove to be identical with the pancreatic factor other than choline which affects liver fat in depancreatized dogs. Until these points are settled the active substance in lipocaic cannot be accepted as an internal secretion of the pancreas.

13. Best, C. H., and Ridout, J. H.: Choline as a Dietary Factor, in Luck, J. M., and Smith, J. H. C.: Annual Review of Biochemistry. Stanford University, Calif., Stanford University Press, 1939, vol. 8, p. 349.

The Laughing Philosopher.—Democritus (470, 460?-420 B. C.) was called the Laughing Philosopher and was a manic-depressive of considerable ability. While his contributions to psychiatry were not numerous, he was the first to construct a quantitative theory of atoms as a basal structure of matter. His system of philosophy is known as the "atomic" system. Democritus is said to have been cured of melancholia by Hippocrates but, nevertheless, he later committed suicide.—Lewis, Nolan D. C.: A Short History of Psychiatric Achievement, New York, W. W. Norton & Co., Inc., 1941.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS. HOWARD A. CARTER, Secretary.

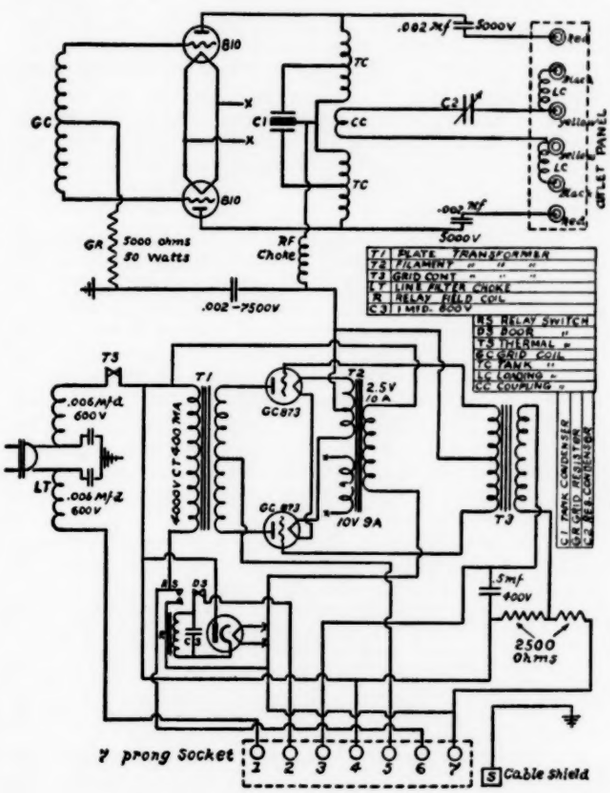
GENERAL AUTOMATIC MODEL D-90 SHORT WAVE UNIT ACCEPTABLE

Manufacturer: General Automatic Corporation, Macedonia, Ohio.

The General Automatic Model D-90 Short Wave Unit is designed for use in medical and surgical diathermy. The unit may be used with cuff or air spaced electrodes, induction cable and surgical electrodes. The steel cabinet in which the apparatus is mounted is 24 inches wide, 14½ inches deep, 42 inches high in the front and 48 inches high in the rear; the apparatus weighs 125 pounds. The firm claims that the cabinet incorporates scientifically designed ventilation, and intake ports on the bottom and outlet grills at the top rear provide a "chimney" effect.

General Automatic Model D-90 Short Wave Unit.

Of the four tubes used in the unit, two are HF-175 high frequency oscillators and two are GC-873 grid control mercury vapor rectifiers. A fifth tube (standard radio type, 12 by 3) is used as a relay rectifier in the automatic time delay circuit. The circuit is of the conventional tune plated, tuned grid type.



Schematic diagram of circuit.

In physical tests conducted by the Council, the power output was found to be 500 watts and the final transformer temperature by the resistance method 80.2 C., which is within the limits of safety prescribed by the Council.

Evidence to substantiate claims made for heating tissues was submitted by the firm in the form of data of deep tissue heating measurements. The data are as follows:

Application: *Air Spaced Electrodes*—Average of 6 tests.
Technic: Two 5¼ circular disks. Average distance 7 inch centers, and equally distant from the thigh cannula. Plate current 150 milliamperes. Dielectric-Air.

	Initial	Final
Deep Muscle Temperature	98.6 F.	107.3 F.
Oral Temperature	98.6 F.	98.7 F.

Application: *Double Cuffs*, Average of 6 tests.
Technic: Two cuffs 2¾ by 18¾ inches. Distance 6½ to 7 inch centers placed equidistant from thigh cannula. Three-fourths inch felt spacing plus one hand towel. Plate current 75-100 milliamperes.

	Initial	Final
Deep Muscle Temperature	98.6 F.	105.3 F.
Oral Temperature	98.7 F.	98.7 F.

Application: *Inductance Cable*, Average of 6 tests.
Technic: Four turns of cable around the thigh; two turns above and two turns below the cannula equally spaced. Three-fourths inch felt spacing and one layer of hand towel between skin and cable. 7 inches overall from upper to lower turns. Plate current, 125 milliamperes.

	Initial	Final
Deep Muscle Temperature	98.6 F.	108.2 F.
Oral Temperature	98.9 F.	99.5 F.

The Council test to determine the frequency drift indicated that it was somewhat more than 0.5 per cent.

The Council voted to accept the General Automatic D-90 for inclusion on its list of accepted devices.

BRITESUN INFRA-RED LAMPS MODELS A-4, A-52, A-537 ACCEPTABLE

Manufacturer: Vogel-Peterson Company, Inc., 1801 North Wolcott Avenue, Chicago.

The Britesun Infra-Red Lamps, Models A-4, A-52 and A-537, produce infra-red radiation for therapeutic purposes.

Model A-4 lamp is mounted on a stand adjustable vertically from 22 to 80 inches which has a 15½ inch heavy base described as "nontipable" and a chromium plated extension and adjustable arm. A 750 watt generator is mounted in a bowl shaped reflector.

Model A-52 lamp is mounted on a stand adjustable vertically from 28 to 72 inches and which has a heavy 11 inch base and a chrome plated extension and adjustable arm. A 600 watt generator is mounted in a bowl shaped reflector.

Britesun Infra-Red Lamp, Model A-52.

Model A-537 lamp is said to be useful for diagnosis as well as treatment. Its stand adjusts vertically from 12 to 67 inches, horizontally, and tilts and rotates without set screws, holding any position, and is provided with a 12 inch heavy base. A 325 watt generator is mounted in an 11 inch reflector for therapeutic purposes, and for diagnostic use an ordinary bulb may be inserted.

Both burners are of the resistance type with a black metal cover over the resistance wire, which is embedded in refractive material. It requires some time for the burner to warm and generate heat, but this delay is no slower than with others of a similar design.

The Council voted to accept the Britesun Infra-Red Lamps, Models A-4, A-52 and A-537 for inclusion on its list of accepted devices.

UNITED DIATHERMY APPARATUS NOT ACCEPTABLE

Manufacturer: United Diathermy, 154 East Erie Street, Chicago.

The United Diathermy Apparatus is advertised and sold directly to the public as a means of alleviating pain occurring in diversified pathologic conditions. The following statements are taken from a recent advertisement in a Chicago newspaper:

"STOP . . . ALLEVIATE YOUR PAIN! with SHORT WAVE Diathermy. If you suffer from ARTHRITIS, *Rheumatism, Sciatica, Bursitis, Lumbago, Neuralgia, Sinus Trouble.* INNER HEAT FOR INNER HEALTH."

"Don't keep on suffering day after day. . . . Science has found a way to ALLEVIATE YOUR AGONIZING PAINS . . . a remedy so simple and effective as to seem a miracle. Thousands have already discovered what SHORT WAVE diathermy can do . . . and today are leading happier lives. The great secret of short wave diathermy is INNER HEAT . . . heat that penetrates deeply . . . right into those sore and afflicted muscles, nerves, tissues and joints . . . that give you such wrenching pains. All over the world . . . in leading hospitals . . . by eminent specialists and medical authorities . . . SHORT WAVE diathermy is being used successfully. Today YOU can alleviate quickly the agonizing pains of RHEUMATISM . . . ARTHRITIS . . . LUMBAGO . . . SCIATICA . . . and other MUSCULAR ailments. Why suffer any longer? The UNITED Portable model is as simple and safe to operate as your radio . . . it is the last word in home Short Wave Diathermy . . . it is just as efficient as the equipment used in hospitals. In order to prove to you what UNITED SHORT WAVE DIATHERMY can do for YOU . . . we invite you to try it IN YOUR OWN HOME . . . at absolutely no cost to you . . . Just fill out the coupon and you can have a FREE TRIAL . . . RIGHT IN YOUR OWN HOME."

The Council has frequently pointed out that short wave apparatus is in most instances ineffective or even dangerous in the hands of an inexperienced layman and that an experienced physician or technician should operate an efficient apparatus so that it will benefit the patient. This opinion is in contradiction to the firm's opinion; namely, "The United Portable Model is as simple and safe to operate as your radio. . . . It is just as effective as the equipment used in hospitals."

Diathermy is contraindicated in some forms of arthritis; its use in the acute infectious type may result in definite harm to the patient. The acquiring of such an apparatus for use in the home may also prevent the suffering patient from seeking competent medical advice and treatment because it may give him a feeling of false security.

In actively promoting the sale of diathermy apparatus to inexperienced laymen for self treatment, the firm is, in the opinion of the Council, carrying out methods detrimental to rational therapeutics. Therefore the Council on Physical Therapy voted to declare the United Diathermy apparatus unacceptable for inclusion on its list of accepted devices.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

THEODORE G. KLUMPP, M.D., Secretary.

ACETYL-BETA-METHYLCHOLINE

Acetyl-beta-methylcholine is a choline derivative with sufficient stability within the body so that it may be employed in certain conditions in which the effects of parasympathetic stimulation are desirable. Its actions resemble the "parasympathetic" actions of acetylcholine with little or none of the latter's "nicotine" effect. It exerts a depressant effect at the sinoauricular node, auricular musculature and auriculoventricular node and bundle of the heart and stimulates gastrointestinal peristalsis. The bradycardia induced by the drug is blocked by quinidine, which also antagonizes its prolongation of auriculoventricular conduction. It also produces a general vasodilatation of blood vessels which are not known to be innervated by parasympathetic nerves, with a subsequent fall in blood pressure. The drug may therefore be regarded as a physiologic antagonist to epinephrine. All its effects are intensified and prolonged by physostigmine and prostigmine through their inhibition of cholinesterase but are quickly and completely abolished by atropine.

Unlike acetylcholine, the drug is capable of exerting a physiologic effect when administered orally. When injected subcutaneously its actions appear to be more prolonged than those of acetylcholine, although the effect on the heart rate and blood pressure persists for only a few minutes. Its intravenous injection is dangerous.

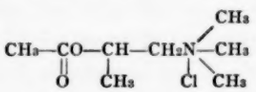
Crystalline water-soluble salts of the base, acetyl-beta-methylcholine, are employed to produce the effects of the drug. The salts are more or less hygroscopic, and if this tendency is extreme, as in the case of the chloride, the crystals must be protected from atmospheric moisture until placed in solution. Acetyl-beta-methylcholine chloride is therefore not suitable for

oral administration in crystalline form but should be given in solution. The entire contents of containers of this salt should be put into solution immediately when these are once opened. Solutions of acetyl-beta-methylcholine chloride are fairly stable and will keep for at least two or three weeks. They are relatively stable to heat and may be refrigerated to delay mold growth.

The application of aqueous solutions of acetyl-beta-methylcholine chloride by the method of ion transfer (iontophoresis) to introduce this salt into the tissues by means of direct (galvanic) current is recognized as the best means to obtain the local effects of the drug on the extremities. General (systemic) effects are produced by this method but are less pronounced than when the drug is administered orally or by injection. The systemic effects produced in this way have not been observed to be of a serious or dangerous nature.

The following precautions should be observed in the administration of the drug: (1) Never administer intravenously because of the danger of cardiac arrest; (2) consider bronchial asthma, hyperthyroidism, coronary occlusion and any severe illness as contraindications; (3) avoid massage at the site of injection, except where this may be necessary to determine when a further injection is needed, and then only gently and with due caution; (4) advise recumbence during injection to avoid possible fainting; (5) the method of ion transfer (iontophoresis) should be employed only by those specially trained in such application and should not under any circumstances be used directly over ulcers or open wounds and only with care over scar tissue; extreme care is necessary to prevent burns by galvanism and the essentials of the "Safety Rules in Galvanism" outlined by Kovacs (Principles and Practice of Physical Therapy, vol. III, pp. 10 and 11) should be followed in the administration of the drug by this method; (6) prolonged therapy by any method of administration is inadvisable and is contraindicated when grave side reactions occur.

MECHOLYL CHLORIDE. — Acetyl-beta-methylcholine chloride.—Trimethyl-beta-acetoxy-propyl-ammonium chloride.—The acetyl ester of beta-methylcholine chloride having the following formula:



Actions and Uses.—Mecholyl chloride is useful in the treatment of selected cases of paroxysmal auricular tachycardia not responding to the usual therapeutic measures, by subcutaneous injection only, in the palliative local treatment of chronic rheumatoid (atrophic) arthritis by the method of ion transfer (iontophoresis) only, and in the treatment of chronic ulcers, Raynaud's disease, scleroderma and other vasospastic conditions of the extremities, preferably by the local method of ion transfer (iontophoresis) but also by oral or subcutaneous administration when the former cannot be employed. For the prevention of attacks of paroxysmal tachycardia the drug is inferior to quinidine and is of no apparent value in other forms of tachycardia and in auricular fibrillation. Claims for the use of the drug in the treatment of bladder dysfunction, abdominal distention, atonic constipation, pelvic inflammation, functional dysmenorrhea, atrophic rhinitis, glaucoma and hypertension are not warranted on the basis of existing clinical evidence. (Also see preceding article, Acetyl-Beta-Methylcholine.)

Dosage.—Considerable variation in the oral dosage requirements is to be expected because mecholyl chloride is to some extent destroyed by the gastric juice. The therapeutically effective oral dose usually ranges from 0.2 to 0.5 Gm. (3 to 7½ grains) two or three times a day, administered by dissolving in a little water which may be added to milk to disguise the bitter taste. In overcoming vascular spasm due to moderate exposure to cold, oral doses of from 0.05 to 0.1 Gm. (¾ to 1½ grains) have been found to be effective. In Raynaud's disease, scleroderma and ulcers the effective oral dose may be somewhat higher.

The subcutaneous dose should be limited to 0.01 Gm. (⅙ to ⅛ grain) on the first injection to test the patient's tolerance. If well tolerated, the dose may be cautiously increased up to 0.025 Gm. (about ⅜ grain). This dose is usually adequate for injection when this method of administration is employed in the treatment of Raynaud's disease, scleroderma, chronic ulcers and other vasospastic conditions of the extremities. In paroxysmal auricular tachycardia from 0.02 to 0.04 Gm. (about 3/10 to 3/5 grain) is injected subcutaneously. If a second injection is required, it is advisable to wait about ten to twenty minutes until the effect of the first has disappeared, and then only after cautious gentle massage at the site of the first injection. Cumulative, or overdosage, effects may be quickly abolished by an injection of atropine sulfate 0.0006 Gm. (1/100 grain).

For application of mecholyl chloride by the method of ion transfer (iontophoresis) it is customary to use a 0.2 to 0.5 per cent (1:500 to 1:200) solution of the drug in distilled water. The solution is applied by moistening the positive electrode fabric which is placed over or near the part to be treated. The strength and duration of the galvanic current regulates the dosage and should always be applied gradually and within the point of comfortable tolerance by the patient. The patient should be instructed to report any sensation of excessive heat or burning. If this occurs, the treatment should be stopped and an inspection made to determine if an electrode is improperly placed. The initial treatment should not exceed 5 to 10 milliamperes for thirty minutes. Subsequent treatments usually require from 25 to 30 milliamperes applied for twenty to thirty minutes. Each treatment should be restricted to a limited area such as one hand or one joint when several parts are involved. Three or four days is considered the most satisfactory interval between treatments. The number of treatments necessary to obtain results varies with the patient and with the type of lesion. In Raynaud's disease and scleroderma, ten or more treatments may be necessary to secure improvement; in chronic rheumatoid arthritis the treatments may be reduced to intervals of a week after the first four to six treatments; in varicose indolent and gangrenous ulcers, treatments may be given daily at the start to promote granulation of tissue and then reduced after the first few treatments to two or three times a week. During and after treatments by ion transfer (iontophoresis) the patient should be covered and protected from drafts and should remain quiet and be kept warm for about thirty minutes after each treatment before being permitted to resume activity.

Idiosyncrasy to mecholyl chloride may result in difficulty in breathing. If this is noted the treatment should be stopped and the patient raised to a sitting position. If untoward symptoms do not subside, atropine sulfate should be given hypodermically at once.

Manufactured by Merck & Co., Inc., Rahway, N. J. U. S. patent 2,040,146 (May 12, 1936; expires 1953). U. S. trademark 318,783.

Bottles Mecholyl Chloride (Crystals), 1 Gm. and 10 Gm.—For the preparation of solutions for oral administration and for ion transfer (iontophoresis).

Sealed Tubes Mecholyl Chloride (Crystals), 0.025 Gm.—For the preparation of solutions for subcutaneous injection.

Mecholyl chloride occurs as a white, crystalline, very hygroscopic powder, possessing a slight odor; readily soluble in water and alcohol, insoluble in benzene and ether. The aqueous solution is neutral to litmus. Mecholyl chloride melts at 168 to 171 C.

Dissolve about 1 Gm. of mecholyl chloride in 10 cc. of water; to a 1 cc. portion add 1 cc. of alcohol and 1 cc. of sulfuric acid and heat in a steam bath *(odor of ethyl acetate becomes perceptible)*; to another 5 cc. portion add 2.5 Gm. of potassium hydroxide and heat *(odor of trimethylamine is noticed)*; to the remaining portion add an excess of silver nitrate solution *(a white, curdy precipitate soluble in ammonia water results)*. Add. 3 cc. of a 20 per cent aqueous solution of sodium perchlorate to 2 cc. of a 10 per cent solution of mecholyl chloride; shake thoroughly and cool in ice water: no precipitate is formed *(acetylcholine)*. Moisten about 0.1 Gm. of mecholyl chloride with a 5 per cent solution of platinic chloride: small rhombohedric plates are formed *(distinction from acetylcholine chloride, which forms needles, and choline chloride, which forms no crystals)*. Dissolve 0.2 Gm. of mecholyl chloride in 2 cc. of sulfuric acid: the solution is colorless *(readily carbonizable substances)*.

Dry about 0.5 Gm. of mecholyl chloride, accurately weighed, to constant weight at 110 C.: the loss in weight does not exceed 1.5 per cent. Incinerate about 0.5 Gm. of mecholyl chloride, accurately weighed, in a platinum crucible: the residue does not exceed 0.1 per cent. Transfer about 0.5 Gm. of mecholyl chloride, previously dried at 105 C. to 110 C., to a 500 cc. Kjeldahl flask and determine the nitrogen content according to the official method described in Methods of Analysis of the Association of Official Agricultural Chemists: the percentage of nitrogen is not less than 7 nor more than 7.25.

Dissolve about 0.4 Gm. of mecholyl chloride, previously dried at 105 C. to 110 C. and accurately weighed, in 15 cc. of water in an Erlenmeyer flask; add 40 cc. of tenth-normal sodium hydroxide solution and heat on the steam bath for forty-five minutes; stopper and allow to cool; titrate the excess of sodium hydroxide solution with tenth-normal hydrochloric acid using phenolphthalein as an indicator: the amount of acetyl (CH_3CO—) is not less than 21.7 per cent nor more than 22.3 per cent.

Transfer about 0.4 Gm. of mecholyl chloride, previously dried at 105 C. to 110 C. and accurately weighed, to a 100 cc. volumetric flask, dissolve in 50 cc. of water, with agitation add 30 cc. of tenth-normal silver nitrate solution, add 5 cc. of nitric acid, and finally add water to final volume and mix thoroughly. Filter through a dry filter into a dry flask, rejecting the first filterful; titrate 50 cc. of the filtrate with tenth-normal ammonium thiocyanate solution using ferric alum as an indicator: the amount of chlorine (Cl—) is not less than 17.9 per cent nor more than 18.4 per cent.

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SATURDAY, SEPTEMBER 6, 1941

THE NEW PHARMACOPEIA—U. S. P. XII

The Committee of Revision of the U. S. Pharmacopeia has issued a proposed list of preparations that will be included in the forthcoming twelfth revision of the U. S. Pharmacopeia. In a separate listing appear those preparations which were official in U. S. P. XI but are not to be included in the new edition. These are referred to as "deletions." Both lists are printed elsewhere in this issue of THE JOURNAL (page 883). The committee is to be congratulated for its splendid work in bringing this important book of official drugs into line with the most recent medical and pharmacologic advances. Perhaps never before has the pharmacopeial list been brought so nearly into apposition with the best medical practice of the day.

Of greatest interest, of course, is the imposing list of about one hundred and eighty-nine new inclusions, which naturally reflects the recent rapid advances, especially in chemotherapy, vitamin and glandular therapy. One finds the sulfonamide drugs up to and including sulfathiazole, the synthesized vitamins up to and including menadione. Endocrinology is represented by such recent developments as testosterone propionate and desoxycorticosterone acetate (the committee has sensibly abbreviated desoxycorticosterone to desoxycortone). Of the newly admitted drugs, about two thirds are now included in New and Nonofficial Remedies, a tacit acknowledgment of the important role played by this work in providing the physician with early authoritative information on new drugs. Mention should be made of the large number of tablets, including acetylsalicylic acid tablets, that have been derived from the National Formulary.

In the previous volume the Committee of Revision began the policy of including preparations bearing trademarked names, when the trademark had been dedicated to the public. The current Committee of Revision has taken another important step forward, perhaps the most significant step in two decades, in including preparations that are subject to patent control. Examples are amphetamine (Benzedrine), butaprobenz sulfate (Butyn Sulfate), butyl amino benzoate (Butesin), chlorazodine (Azochloramide), diphenyl hydantoin soluble (Dilantin Sodium), mercurphylline (Mercupurine), mersalyl (Salyrgan), metarsen (Mapharsen), neostigmine bromide (Prostigmine Bromide) and quinacrine (Atabrine). One notes finally the admission of insulin, crystalline zinc insulin and protamine zinc insulin.

The committee apparently expects some protests on its excellent list of "deletions," for it appends a series of brief statements defending each one. These may be roughly classified as (1) those simply found wanting, (2) those replaced by newer and better preparations, (3) pharmaceutic "necessities" found unnecessary and (4) those whose value is outbalanced by danger or inconvenience of use. Of the approximately fifty-five omissions, about thirty are in the "found wanting" category. These include such preparations as acetyltannic acid, albumin tannate, arsenic triiodide and the familiar "brown mixture." In the category of some sixteen superseded drugs are acriflavine, asafetida, copaiba, dichloramine-T, iodoform, merbaphen and extract of nux vomica. Few enlightened and progressive physicians would sharply disagree with the committee's decisions on deletions.

STUDIES IN POLIOMYELITIS

Among the most important unsolved problems in infantile paralysis is the port of entry of the virus. The recent experimental work of Howe and Bodian, supported by the Commonwealth Fund and reported in the August issue of the *Bulletin of the Johns Hopkins Hospital,* presents an opportunity for reviewing some of the newer facts and concepts with regard to the nature of this disease.

In estimating the rate of progression of poliomyelitis virus in the sciatic nerve of the rhesus monkey,[1] the investigators inoculated the nerve at a single point and subsequently cut it at a higher level, at various intervals in different animals, to prevent an infective dose of virus from reaching the spinal cord. The rate was estimated to be approximately 2.4 mm. an hour. An attempt was made thus to control the variability introduced by the incubation period. The method of inoculation, the homogeneity of the virus suspension and the latent period before spread begins were carefully controlled. The latent period was estimated to be about eleven hours.

The authors [2] also studied the movements of poliomyelitis virus in the central nervous system of three groups of rhesus monkeys after transection of the spinal cord in the midthoracic region. The first group consisted of 4 animals in which paralysis was induced by intracerebral or intranasal inoculation. Virus and

1. Bodian, David, and Howe, H. A.: The Rate of Progression of Poliomyelitis Virus in Nerves, Bull. Johns Hopkins Hosp. **69:** 79 (Aug.) 1941.

2. Howe, H. A., and Bodian, David: The Effect of Spinal Transection on the Spread of Poliomyelitis Virus in the Nervous System of the Rhesus Monkey, Bull. Johns Hopkins Hosp. **69:** 86 (Aug.) 1941.

lesions of poliomyelitis were demonstrated in 1 case in the lumbar cord. The second group contained 4 animals in which the sciatic nerve was inoculated. Two of these showed progression of virus into the cord above the level of transection—possibly along the paravertebral sympathetic chains. The third group consisted of 11 animals which were inoculated directly into the lumbar cord. Four of these had bilateral sympathectomies of two to three ganglions at the level of the spinal cord transection. Eight of this third group of 11 spinal animals showed progression of virus into the remainder of the neuraxis. The experiments demonstrated clearly that interruption of the continuity of the spinal cord, the sympathetic nervous system and the subarachnoid space did not prevent virus from passing into the rostral portion of the neuraxis. The only possible remaining routes for virus were the lymphatics, the blood stream or some unusual nervous connections. The authors suspect the participation of the vagus nerve in the cases in which sympathectomy had been performed. Four of the animals in particular showed an unusual clinical picture which suggested a vagus syndrome. Examination of the brain of these animals in serial sections revealed unusually heavy involvement of the vagal nuclei in the medulla.

In an attempt to throw light on the variability in the resistance of a cell to virus, Howe and Bodian [3] sectioned the olfactory tracts. After some time the cells of the olfactory bulbs developed a refractoriness to virus. The authors concluded that the metabolic changes in the cell body which accompany the regeneration of the axon brought about a striking increase in the resistance of these cells to destruction by poliomyelitis virus. These experiments represent an original contribution to a wholly uninvestigated field of virus-host relationship.

The problem of the existence of a nonparalytic or arrested poliomyelitis involves the following questions: 1. Can the virus of poliomyelitis enter the central nervous system and spread within it without production of demonstrable lesions or of clinical symptoms referable to the nervous system? 2. What is the minimal amount of pathologic change which may be found in nonparalytic cases, and can the pathologic process be arrested before the typical distribution of lesions in the brain is fully developed? 3. How far can the pathologic process extend in the brain and spinal cord without being severe enough to produce clinically evident paralysis?

Bodian and Howe [4] were able to present evidence from results in chimpanzees and rhesus monkeys that the disease of the nervous system produced by the virus of poliomyelitis may be spontaneously arrested in any stage after the virus has entered the nervous system. This arrest may take place preceding any paralysis, thus producing a nonparalytic attack in which lesions are present in the central nervous system, or it may occur after the onset of paralysis. The minimal degree of pathologic change observed in nonparalytic cases is a regional destruction of neurons, associated with characteristic mesodermal-glial infiltrations and perivascular cuffing, at and near the site of entry of the virus into the central nervous system. The spinal cord need not be involved. The maximal degree of pathologic change observed in nonparalytic cases is practically equivalent in distribution and severity to the pathologic involvement which is found in paralytic cases. The absence of observable paralysis in many cases, according to the authors, is due to the fact that, although many nerve cells are destroyed in the spinal cord, the distribution of the destroyed motor neurons is too scattered to involve a single functional muscle group sufficiently to produce clinically evident functional loss. These results parallel closely those of Sabin and Ward [5] in rhesus monkeys, with the exception that the authors have shown that there need not be any lesions in the cord. In fact, they state that the virus of poliomyelitis is capable of producing an encephalitis, with or without the associated clinical symptoms, in the absence of any pathologic change in the spinal cord.

In their experimental approach to the problem of the port of entry of virus, the authors selected chimpanzees because of their closeness to man as a primate and because of their reported susceptibility to poliomyelitis by natural contagion. Various concepts have been entertained as to the port of entry of poliomyelitis of man. It was believed to originate in the upper respiratory tract and from there to invade the nervous system. The olfactory portion of the nasal mucosa was, by many, considered to be the original site; prophylactic measures were based on this concept. It was also believed that virus may enter the skin through an insect bite or through direct contamination. The gastrointestinal tract as the primary seat loomed as a possibility when it was found that virus was frequently present in stools. The theory of nasal infection made the greatest appeal, particularly because it found support in experimental studies which showed that virus instilled intranasally in rhesus monkeys could invade the nervous system only by the olfactory pathway. Howe and Bodian [6] inoculated 6 chimpanzees in pairs with human stools containing poliomyelitis virus. Two animals received the inoculum intranasally, 2 intraorally and 2 by stomach tube. In each of the last 2 pairs 1 animal had been subjected to bilateral olfactory tract section. All the animals contracted poliomyelitis. The entire brain stem and considerable portions of the cortex, spinal cord and peripheral nervous system were

3. Howe, H. A., and Bodian, David: Refractoriness of Nerve Cells to Poliomyelitis Virus After Interruption of Their Axons, Bull. Johns Hopkins Hosp. **69**: 92 (Aug.) 1941.

4. Bodian, David, and Howe, H. A.: The Pathology of Early Arrested and Nonparalytic Poliomyelitis, Bull. Johns Hopkins Hosp. **69**: 135 (Aug.) 1941.

5. Sabin, A. B., and Ward, Robertson: Nature of Nonparalytic and Transitory Paralytic Poliomyelitis in Rhesus Monkeys Inoculated with Human Virus, J. Exper. Med. **73**: 757 (June) 1941.

6. Howe, H. A., and Bodian, David: Poliomyelitis in the Chimpanzee: A Clinical-Pathological Study, Bull. Johns Hopkins Hosp. **69**: 149 (Aug.) 1941.

studied in serial sections. Lesions in the olfactory bulbs and secondary olfactory nuclei were present only in the animals receiving intranasal inoculations. There was a good correlation between the development of bulbar paralysis and intraoral inoculation. One animal of this pair showed definite microscopic evidence that the virus had reached the central nervous system over the fifth and possibly the ninth nerve. In the animals which received stomach tube inoculations there was microscopic evidence that the virus had reached the brain by ascending from the spinal cord. It was convincingly demonstrated that invasion of the central nervous system by way of the olfactory bulbs takes place only after intranasal inoculation. The knowledge acquired with regard to the distribution of lesions and differences in the severity of involvement of certain centers after inoculation of virus into various ports has suggested to Howe and Bodian that a comparative analysis of the distribution of the lesions in human poliomyelitis should lead to a determination of the port of entry in man, based on pathologic evidence alone. Harbitz and Scheel of Christiania, Norway, as early as 1907 described the distribution of lesions of the brain in 17 cases of human poliomyelitis and noted the absence of lesions in the olfactory bulbs and tracts. These results were substantiated by a number of other observers, particularly Swan. Many investigators have now come to regard the absence of lesions or virus in the olfactory bulbs as important evidence in ruling out the olfactory route as the predominant port of entry in man. Howe and Bodian [7] had an opportunity to study 13 fatal cases observed during the late summer of the 1940 epidemic in Indiana, Ohio and West Virginia. Thirteen human brains, 8 of which included complete olfactory bulbs, were studied. Uninterrupted serial sections of the olfactory bulbs and brain stems of these brains were prepared, as were also serial sections of large blocks of cerebral cortex from the frontal, parietal, temporal and occipital lobes. The sections of the brains were cut at 60 microns and those of the olfactory bulbs at 10 microns, all being stained with gallocyanin. The material was obtained either from rapidly fatal cases of poliomyelitis or from cases in late stages of the acute illness. It is to be expected therefore that the spread of lesions was fully developed, and comparable in that sense with severely paralytic experimental cases. The authors were not able to obtain human material in the preparalytic or extremely early stage. The most striking single observation made by them was that the olfactory bulbs were not invaded in the majority of their cases. In no case was there indication that the olfactory port was operative. The distribution of lesions in the human brain was found to be entirely comparable with that seen in the rhesus monkey and the chimpanzee when these animals are inoculated by nonnasal ports. This indicates that dissemination of virus in the central nervous system follows fiber pathways in the same pattern demonstrated for other observations; also the differential cell susceptibilities within the brain and spinal cord are the same.

Many factors point to the alimentary tract as a locus of virus proliferation. In many instances the material suggests that the spinal cord is the primary site of invasion of the central nervous system. It has not been possible, however, for the authors to determine the precise pathway of the virus from the intestine to the central nervous system except in 1 case in which the vagus nerve was strongly suggestive. In 1 case there was evidence that the nerves supplying the pharynx were the path of entry. This careful microscopic study presents additional evidence that there may be many ports of entry of the virus and that the olfactory route is probably of little importance in man.

7. Howe, H. A., and Bodian, David: Neuropathological Evidence on the Portal of Entry Problem in Human Poliomyelitis, Bull. Johns Hopkins Hosp. **69**: 183 (Aug.) 1941.

Current Comment

DIPHTHERIA PREVENTION IN NEW YORK STATE

A press release by the New York State Department of Health [1] indicates that fifty-two of sixty-nine upstate communities reported 35 per cent or more of children under 5 years of age immunized against diphtheria as of June 1, 1941. The percentages were based on population estimates from births and deaths as of June 1, 1940. Godfrey [2] showed that immunization of 35 per cent or more of children under 5 years in a given community would make that community reasonably safe from an outbreak of the disease, although unimmunized children would, of course, remain susceptible, and there might be sporadic occurrences of diphtheria. The same study by Godfrey showed also that immunization of much larger percentages of children of school age did not protect the community against an outbreak of diphtheria. In the light of these studies, it is of particular interest to note the three cities of Peekskill, Middletown and Johnson City with 100 per cent of children under 5 years immunized against diphtheria, and Newburgh with 99 per cent. On the other hand, seventeen cities—Buffalo, Cortland, Lockport, Dunkirk, Cohoes, Fulton, Rensselaer, Garden City, Glen Cove, Hempstead, Rockville Center, Floral Park, Freeport, Lynbrook, Mineola, Watervliet and Valley Stream—had less than 35 per cent immunized. Buffalo is the only city of considerable size in the latter list, indicating that size alone is not the determining factor. In fact, "all of the twenty-two municipalities in the 25,000 or more population groups" reported 35 per cent or more of children under 5 immunized as of June 1; whereas

1. New York State Department of Health, Albany, Press Release, mimeographed, July 14, 1941.

2. Godfrey, Edward S.: Study in the Epidemiology of Diphtheria in Relation to the Active Immunization of Certain Age Groups, Am. J. Pub. Health **22**: 237 (March) 1932; Godfrey, Edward S., Practical Uses of Diphtheria Immunization Records, ibid. **23**: 809 (Aug.) 1933.

only thirty-one of the forty-seven municipalities of between 10,000 and 25,000 population were able to make such a report. Diphtheria is a disease which a community may virtually choose to have or not to have. Since the bacteriology of the disease, its immunology and the community methods for the prevention of outbreaks are known, there would seem to be no good reason why every community, through joint effort of health officials, physicians and parents, should not be free from diphtheria. Only by its eradication in local communities can diphtheria be eradicated from the national disease picture.

THE PUEYO VACCINE FOR TUBERCULOSIS

Recently newspapers and magazines have featured pictures of riots in the Argentine and in Ecuador among patients suffering with tuberculosis who, it seems, were demanding of the government the right to be inoculated with a new vaccine supposed to be useful in the treatment of this disease. The vaccine was apparently developed by one Jesus Pueyo, who was a laboratory bacteriologic assistant in the Medical School of Buenos Aires. The first announcement of his alleged discovery appeared in the newspapers of that city. Incidentally, he had previously announced a similar vaccine for leprosy. Because of the method of presentation of this discovery, scientific physicians were inclined to discount it completely; indeed the medical authorities simply refused to make tests of the product. Later the minister in charge of these matters in the Argentine invited Mr. Pueyo to demonstrate his preparation in the state laboratories. The results of this scientific attempt were wholly negative, and the minister forbade the use of the vaccine in the Argentine. In Uruguay it is reported that the minister of health is about to promulgate a similar resolution, and in Chile the director of public health has ordered that a study of this product be made, limited exclusively to animals. Because of the activities of the discoverer in the Argentine, according to a report published in *La Nacion* of Buenos Aires, the National Department of Hygiene has imposed a fine on the investigator. It was proved that he had distributed the vaccine without any permit from the government Office of Hygiene. He was therefore assessed a fine of 1,000 pesos.

HEALTH EDUCATION IN CINCINNATI

The Public Health Federation of Cincinnati has issued a report on its health education program from June 1940 to June 1941.[1] The program outlined is carried out through the Public Health Federation, which is a federated agency in which are represented many public health groups in the city of Cincinnati. This health education program was carried on by the federation acting as the agency for a cooperative effort by the Cincinnati Academy of Medicine, the board of health and the other public health agencies. In carrying this health education program to the public, use was made of newspaper articles, radio dramatizations, car cards, factory posters, bulletins to parent-teacher associations, cards to physicians, public health lectures, exhibits, motion picture showings and printed matter. The newspaper articles are carried daily as educational columns under the title "Save a Life." Car cards are placed in all the street cars and some busses. Factory posters are posted in all factories, and physicians' cards keep all physicians in close touch with the health education program. Included in the list of subjects were thirty-eight principal topics including anemia, burns, child health, diabetes, eyes, first aid, general health, hearing, influenza, mental hygiene, physical examination, rabies, safety, tuberculosis and venereal diseases. In addition a large miscellaneous classification included fifty-four other topics, such as allergy, constipation, deodorants, fainting, glands, headaches, industrial health, marihuana, nerves, overweight, posture, quacks, rats, smoke, tonsils, underweight, women, yellow fever and roentgen rays. This report exemplifies in simple practical form the principles of health education which can be applied in any community, large or small. The grouping of agencies and their cooperation through a federation is a practical demonstration of the community health council recommendation which has often been made but too seldom put into effect. The fact that Cincinnati has done it so well should suggest to public health leaders in other communities the possibility of doing likewise.

1. Health Education Program, June 1940-41, Public Health Federation, Cincinnati, mimeographed. Undated.

STATISTICS IN MEDICINE

The importance of improving the standards of statistical treatment of clinical and laboratory data has been previously discussed in these columns.[1] Recently Campbell,[2] in a consideration of the present statistical inadequacy of many of the papers now appearing in the literature, gave a typical illustration: "In the series with delayed operation, the mortality was 1.5 per cent, whereas in the series with immediate operation, the mortality was 4.8 per cent. Thus it is seen that death occurs more than three times as frequently after immediate operation." While it is true that 4.8 is more than three times 1.5, from the standpoint of recovery there is little difference between 95.2 and 98.5! Any two therapeutic procedures, therefore, which result in such high percentages of recovery are not as different in their results as the quoted method of comparison would imply. The important fact is that the difference is 3.3 and not that 4.8 is three times more than 1.5. This, of course, is only one example, but it is clear that many clinicians still almost entirely neglect satisfactory criteria of statistical analysis in their scientific writings. The necessary technics can be reasonably easily acquired and applied to medical papers, especially those which utilize percentages in their conclusions. Campbell also concludes that medical students should receive formal education in statistical procedure and that medical editors should demand of medical authors that their figures and data be statistically sound. The laxities of the present clearly foreshadow significant developments along these lines.

1. Medical Statistics, editorial, J. A. M. A. **109**: 713 (Aug. 28) 1937.
2. Campbell, H. E.: The Statistical Method—A Vital Tool in Clinical Medicine, Surgery **9**: 825 (June) 1941.

MEDICAL PREPAREDNESS

In this section of The Journal each week will appear official notices by the Committee on Medical Preparedness of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medical preparedness, and such other information and announcements as will be useful to the medical profession.

REHABILITATION OF CANDIDATES REJECTED FOR THE AIR SERVICE

The American Flying Services Foundation, founded by World War fliers, has been incorporated and a medical division is being developed for the purpose of correcting, on a nonprofit basis, the physical defects which have already caused the rejection of numerous candidates for the military air services, many of whom can be reclaimed. The medical headquarters of the American Flying Services Foundation is at 140 East 54th Street, New York City. The medical director is Dr. S. M. Strong, and the medical council comprises:

Lester M. Hubby, M.D., Chairman	Howard Lilienthal, M.D.
Meredith F. Campbell, M.D.	Henry H. Lyle, M.D.
Edmund Prince Fowler, M.D.	Charles H. May, M.D.
Howard Fox, M.D.	Charles A. McKendree, M.D.
Robert Halsey, M.D.	L. M. Waugh, D.D.S.
J. Herbert Lawson, M.D.	David H. Webster, M.D.

This group is already functioning, and a number of air service applicants have already been successfully treated in the New York area, in Columbus, Ohio, and in the area about Los Angeles. It is planned to organize at many points in the United States medical groups to render this service who will give their services gratis or charge only for material used or extremely small fees, their main purpose being to assist the national defense program by adding to the number of airmen who are so urgently needed in the first line of defense. The medical division has no connection with draft boards or with the Selective Service but is in close cooperation with the United States military services. A high percentage of the candidates for enlistment as flying cadets are being rejected because of the strict physical standards required. The medical division of the American Flying Services Foundation will find the doctor, the clinic, the hospital and other necessities for the care and treatment of those rejected whose defects can be remedied to permit them to enter the flying services. These defects are mostly associated with the eye, nose, teeth, cardiovascular or neuromuscular systems, and the longest period spent in the hospital by any one of the patients thus assisted so far has been fifteen days.

The American Flying Services Foundation is young and is entirely dependent on public contributions for its support. The foundation headquarters are at 60 East 42d Street, New York City. Telephone, Vanderbilt 6-0977.

ANOTHER HOSPITAL SHIP FOR THE NAVY

The U. S. S. *Solace*, a hospital ship, was commissioned at Brooklyn, August 9. The *Solace*, which was formerly the liner *Iroquois*, has been fitted out as a four hundred bed hospital, the equal of the most completely equipped hospital of its size on shore. The ship carries thirteen medical officers, thirteen nurses, three pharmacists, three dental officers and one hundred and thirty-eight hospital corps men, besides its operating crew. The *Solace* has six hospital wards, two operating rooms, an eye, ear, nose and throat room, a urologic operating room, a roentgen department, a clinical laboratory, a physical therapy department and a pharmacy. There is a special diet kitchen besides the regular kitchen, and each ward has its own pantry for the preparation of special diets. Meals are served to patients on trays brought to the bedside in electrically heated food carts. An elevator permits movement of patients with a minimum of disturbance from one ward to another or to the operating rooms. Ample deck space gives convalescents opportunities to get into the open air as well as provide recreation for members of the ship's crew. The *Solace* is painted white with a green band and a red cross on each side, the colors prescribed for a hospital ship by the terms of the Hague convention. The senior medical officer assigned to the *Solace* is Capt. Harold L. Jensen, Medical Corps, U. S. Navy, and the executive officer is Comdr. Thomas E. Flaherty. The commanding officer of the ship is Capt. Benjamin Perlman, U. S. Navy. The only other hospital ship in the U. S. Navy is the U. S. S. *Relief*, which was commissioned about 1919.

ARMY HOSPITAL FOR PSYCHOPATHIC CASES

The War Department has leased from the state of Kentucky for the duration of the emergency and for two years thereafter, for a fee of $1 a year, a hospital solely for the treatment of psychopathic patients. The hospital, which is 4½ miles north of Danville, Ky., has a capacity of two hundred and fifty beds and is equipped especially for the treatment of the mentally ill. The War Department has authorized the expenditure of $500,000 for the construction of store houses, officers' quarters, barracks, nurses' quarters and recreation buildings.

MEDICAL OFFICERS TO BE TEMPORARY COLONELS

The War Department has announced that the following forty-three medical officers will be temporarily promoted to the rank of colonel, Army of the United States. In this announcement, which included, in all, nearly three hundred officers from various branches of the Army, it was stated that no increases of pay are involved in most of these promotions. The first list was selected mainly from records of performance over the last ten years. Future lists will be based more and more on the performance of duty since last July and less on performance of duty prior to the emergency. The final list will probably be based on performance of duty during the emergency:

ASH, James E., Philadelphia.
BEACH, George C., Jr., Topeka, Kan.
BERLE, Charles K., Manila, P. I.
BETHEA, James A., Florence, S. C.
CARBONELL, Arturo, Cabo Rajo, Puerto Rico.
CARROLL, Percy J., East St. Louis, Ill.
COATES, Edward A., Jr., Winthrop, Mass.
CORBETT, Sewall M., Arlington, Va.
CORBY, John F., Philadelphia.
DENISON, Walcott, St. Louis.
DIBBLE, John, Camden, N. J.
DUNHAM, George C., Portland, Ore.
EMERSON, Gouverneur V., Milford, Pa.
FOX, Roy E., Dayton, Ohio.
FREER, Arden, Neversink, N. Y.
GRANT, David N. W., Richmond, Va.
HAGINS, William A., Oliver, Ga.
HAINES, Edgar F., Fairhaven, Mass.
HALL, John R., Marshall, Mo.
HAWLEY, Paul R., College Corner, Ohio.
HILL, Robert B., Statesville, N. C.
HUME, Edgar E., Frankfort, Ky.
HUTTER, Charles G., Chicago.
KENNER, Albert W., Fort Banks, Mass.
KRAFFT, Henry L., Otto, N. Y.
LEHMAN, Asa M., Culbertson, Neb.
McKIE, Alva B., Canton, Miss.
MOORE, Harvard C., Bar Harbor, Maine.
NOYES, Edward A., Portland, Ore.
PETTERS, Frederick H., Buffalo.
PORTERFIELD, Herbert D., Indianola, Iowa.
RILEY, Charles W., Baltimore.
SCHULE, Paul A., Preston, Iowa.
SIMMONS, James S., Washington, D. C.
SINCLAIR, Charles G., Port Huron, Mich.
SLOAT, Jesse I., Washington, D. C.
STACEY, Royal K., Dallas, Texas.
STANLEY, Oramel H., Brunswick, Maine.
WATTS, John W., Montgomery, Ala.
WILLIAMS, Robert P., Greencastle, Ind.
WILSON, Bascom L., Greenville, N. C.
WILSON, Frank W., Greenville, N. C.
WINN, Dean F., Macon, Ga.

ARMY RESERVE OFFICERS ORDERED TO ACTIVE DUTY

FIRST CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, First Corps Area, which comprises the states of Maine, Vermont, New Hampshire, Rhode Island, Massachusetts and Connecticut:

ARCHAMBAULT, Henry A., 1st Lieut., Barre, Vt., Fort H. G. Wright, N. Y.
CHAREST, Leandre R., 1st Lieut., Manchester, N. H., Fort Williams, Maine.
CHIAMPA, Francis P., 1st Lieut., Brighton, Mass., Camp Edwards, Mass.
CLOUGH, Joseph M., 1st Lieut., New London, N. H., Fort Ethan Allen, Vt.
COGAN, Michael A., 1st Lieut., Springfield, Mass., Camp Hulen, Texas.
COMEAU, William J., 1st Lieut., Haverhill, Mass., Fort Devens, Mass.
CRONE, Neil L., Captain, Belmont, Mass., Governor's Island, N. Y.
DANIELS, Samuel D., 1st Lieut., Greenwood Mountain, Maine, Bangor, Maine.
KELLEY, Thomas F., 1st Lieut., Brookline, Mass., Fort Adams, R. I.
LEONARD, George A., Lieut. Col., Waterbury, Conn., Camp Blanding, Fla.
ROTHMAN, Maurice S., 1st Lieut., Quincy, Mass., Army Base, Boston.
SHINNEY, Arthur P., 1st Lieut., Everett, Mass., Camp Forrest, Tenn.
VALENSKI, Thaddeus J., 1st Lieut., Thompsonville, Conn., Camp Forrest, Tenn.
WEBSTER, David K., Lieut., Concord, N. H., Fort Banks, Mass.
WEINBERG, Julius, 1st Lieut., Concord, N. H., Fort Banks, Mass.

Orders Revoked

BOTTAMINI, Joseph T., 1st Lieut., Brandon, Vt.
BUNCE, James W., Major, North Adams, Mass.
DANIELS, Samuel D., 1st Lieut., Greenwood Mountain, Maine.
DeMINICO, Luigi B., 1st Lieut., Brighton, Mass.
DUZMATI, Paul P., 1st Lieut., Bridgewater, Conn.
FREEDMAN, Herman S., 1st Lieut., Cambridge, Mass.
HARASIMOWICZ, Paul P., Captain, Gardner, Mass.
SHINNEY, Arthur P., 1st Lieut., Everett, Mass.
SMITH, Hugh A., 1st Lieut., New Haven, Conn.
WEINBERG, Julius, 1st Lieut., Concord, N. H.

THIRD CORPS AREA

The following additional medical reserve officers have been ordered to extended active duty by the Commanding General, Third Corps Area, which comprises the states of Pennsylvania, District of Columbia and Maryland:

ABERNETHY, Hugh Charles, 1st Lieut., West Chester, Pa., Fort Belvoir, Va.
AMBLER, John Thompson Brown, 1st Lieut., Roanoke, Va., Camp Lee, Va.
BROSE, Nicholas Albert, 1st Lieut., Pittsburgh, Holabird Quartermaster Depot, Baltimore.
BROWN, Manuel, 1st Lieut., Baltimore, Camp Shelby, Miss.
BUCKLEY, Michael Lester, 1st Lieut., Arlington, Va., Fort Belvoir, Va.
CAMPBELL, Hawes, Jr., 1st Lieut., Hanover, Va., Fort Belvoir, Va.
CASEY, Adrian Vincent, 1st Lieut., Scranton, Pa., Camp Lee, Va.
DEAN, Francis DeSales, Captain, Washington, D. C., Camp Lee, Va.
DINEEN, Francis Andrew, 1st Lieut., Kittanning, Pa., Fort George G. Meade, Md.
EINHORN, Nathan Harry, Captain, Philadelphia, Camp Lee, Va.
EVANS, Frederick James, Jr., 1st Lieut., Edgewood, Pa., Fort Belvoir, Va.
FERRARO, Francis Peter, 1st Lieut., Sharpsburg, Pa., Camp Lee, Va.
GAALAAS, Alban Felix, Captain, Pasadena, Md., General Dispensary, Baltimore.
HENDERSON, Harry Heim, 1st Lieut., Richmond, Va., Camp Lee, Va.
HOFFMAN, Franklin David, 1st Lieut., Greensburg, Pa., Camp Lee, Va.
KANE, Sydney Heller, 1st Lieut., Philadelphia, Fort Myer, Va.
KATZENSTEIN, Lawrence, 1st Lieut., Baltimore, Fort George G. Meade, Md.
KEMICK, Irvin Bernard, 1st Lieut., Baltimore, Fort George G. Meade, Md.
MAYS, John Richard Shannon, Captain, Baltimore, Fort Belvoir, Va.
McFARLANE, Paul, Captain, Scottsville, Va., Fort George G. Meade, Md.
PLUME, Theodore Waldimar, 1st Lieut., Abington, Pa., Camp Lee, Va.
PRICE, Henkel Moser, 1st Lieut., Martinsville, Va., Camp Lee, Va.
RATTNNE, Edward, 1st Lieut., Elkton, Va., Fort George G. Meade, Md.
SORRELL, William George, 1st Lieut., Amelia, Va., New Cumberland, Pa.
WEINBERG, Tobias, 1st Lieut., Baltimore, Camp Lee, Va.

Orders Revoked

BUCKLEY, Michael Lester, 1st Lieut., Arlington, Va.
BYERS, John Maxwell, 1st Lieut., Hyattsville, Md.
FERRARO, Francis Peter, 1st Lieut., Sharpsburg, Pa.
FORSTER, Hans Walter, Jr., 1st Lieut., Philadelphia.
FREEDMAN, Donald Kenneth, 1st Lieut., Washington, D. C.
PRICE, Henkel Moser, 1st Lieut., Martinsville, Va.
SINGLETON, Albert Olin, Jr., 1st Lieut., Philadelphia.

FOURTH CORPS AREA

The following additional medical reserve corps officers have been ordered to active duty by the Commanding General, Fourth Corps Area, which comprises the states of Tennessee, North Carolina, South Carolina, Alabama, Georgia, Mississippi, Florida and Louisiana:

BURNS, Francis R., 1st Lieut., Birmingham, Ala., Fort Oglethorpe, Ga.
CENTER, Abraham Hyman, 1st Lieut., Savannah, Ga., Fort Jackson, S. C.
CONE, Wallis Dicks, 1st Lieut., Williston, S. C., Fort McClellan, Ala.
COVINGTON, Furman Payne, 1st Lieut., Thomasville, N. C., Camp Livingston, La.
CREECH, Robert Weller, 1st Lieut., Memphis, Tenn., Fort Benning, Ga.
DOUGLAS, Joseph W., 1st Lieut., Brewton, Ala., Camp Stewart, Ga.
EVERHART, Merrill Wesley, Captain, New Orleans, New Orleans Port of Embarkation & General Depot.
FINK, Ira S., 1st Lieut., Mobile, Ala., Fort McPherson, Ga.
FLYNN, James T., Jr., 1st Lieut., Charlotte, N. C., Fort McClellan, Ala.
GADBERRY, Eugene W., 1st Lieut., Nashville, Tenn., Fort Jackson, S. C.
GAHAGAN, Harry Q., 1st Lieut., Coushatta, La., Camp Polk, La.
GEORGE, Wallace E., 1st Lieut., West Columbia, S. C., Fort Benning, Ga.
GILL, Euclid Borland, 1st Lieut., New Orleans, Camp Shelby, Miss.
GISH, George Edward, 1st Lieut., Memphis, Tenn., Camp Livingston, La.
GOODMAN, Sanders Acme, 1st Lieut., Greenville, Miss., Fort Benning, Ga.
HUTCHINSON, Robert H., 1st Lieut., Durham, N. C., Camp Shelby, Miss.
JOHNSON, George E., 1st Lieut., Uriah, Ala., Fort Benning, Ga.
JONES, Albert Mitchell, 1st Lieut., Memphis, Tenn., Fort Jackson, S. C.
KELLEHER, Robert C., 1st Lieut., New Orleans, Camp Livingston, La.
KORNEGAY, Robert D., 1st Lieut., Rocky Mount, N. C., Fort McPherson, Ga.
LIEPPMAN, Jack E., 1st Lieut., Shreveport, La., Ft. Jackson, S. C.
MASSENGILL, Frank C., 1st Lieut., Brookhaven, Miss., Camp Livingston, La.
McCREARY, Frank D., Major, Carville, La., Camp Livingston, La.
MARCUS, Hyman, 1st Lieut., Eutawville, S. C., Camp Davis, N. C.
MOORMAN, John Dement, 1st Lieut., Huntsville, Ala, Fort Jackson, S. C.
NABOS, John F., 1st Lieut., New Orleans, Fort McClellan, Ala.
SULLIVAN, Edgar Nelson, 1st Lieut., Florence, S. C., Camp Livingston, La.
VALENTINE, Frank, 1st Lieut., Western State Hospital, Tenn., Fort Barrancas, Fla.
WARREN, John Windiate, Jr., 1st Lieut., Memphis, Tenn., Fort Jackson, S. C.
WELLS, James Ralston, Major, Daytona Beach, Fla., Camp Shelby, Miss.
WILLIAMS, Ernest H., 1st Lieut., Rocky Mount, N. C., Fort Benning, Ga.
WILSON, Dale Sloan, 1st Lieut., Miami, Fla., Fort Jackson, S. C.
WITT, William J., 1st Lieut., Memphis, Tenn., New Orleans Port of Embarkation and General Depot.

Orders Revoked

BROWN, Richard Kyle, 1st Lieut., Greenville, S. C.
DONATHAN, Earl R., 1st Lieut., Etowah, Tenn.
EVANS, Kenneth P., 1st Lieut., Sylacauga, Ala.
HARGIS, Albert Sydney, Jr., 1st Lieut., Birmingham, Ala.
HENDERSON, Hilliary H., Jr., 1st Lieut., Birmingham, Ala.
HENRY, John A., 1st Lieut., Atlanta, Ga.
HUEY, Thomas F., Jr., 1st Lieut., Anniston, Ala.
KOPFLER, Marion E., 1st Lieut., New Orleans.
LOWENSTEIN, Sol. L., 1st Lieut., Nashville, Tenn.
MERRITT, J. Webster, 1st Lieut., Jacksonville, Fla.
PIZZOLATO, Philip, 1st Lieut., New Orleans.
RAGGIO, Francis W., Jr., 1st Lieut., New Orleans.
ROBBINS, Bernard L., 1st Lieut., Miami Beach, Fla.
ROPER, C. James, 1st Lieut., Jasper, Ga.
SEWELL, Bennette N., 1st Lieut., Boyce, La.
SHERER, Raymond J., 1st Lieut., Jasper, Ala.

SMITH, Leo, 1st Lieut., Waycross, Ga.
THOMAS, John Henry, 1st Lieut., Gainesville, Fla.
THOMPSON, Charles C., Jr., 1st. Lieut., Columbia, Miss.
TRAPP, Walter Russell, 1st Lieut., Tuscumbia, Ala.
WALLIS, Thomas Henry, 1st Lieut., Ocala, Fla.
WATSON, Francis Marion, 1st Lieut., Chipley, Fla.
WOOD, Charles Spencer, 1st Lieut., New Orleans.
WOODS, Harold Vernon, 1st Lieut., Nashville, Tenn.

SIXTH CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, Sixth Corps Area, which comprises the states of Wisconsin, Michigan and Illinois:

ANDERSON, Donald William, 1st Lieut., Oak Park, Ill., 3d Armored Force, Camp Polk, La.
LERY, Abraham J., 1st Lieut., Chicago, U. S. Army Induction Station, Peoria, Ill.
MOORE, Bert E., 1st Lieut., Danville, Ill., Headquarters and Station Complement (Corps Area Service Command), Camp Davis, N. C.
PERLMAN, Lawrence, 1st Lieut., Chicago, Induction Station, Chicago.
REST, David, 1st Lieut., Chicago, Induction Station, Peoria, Ill.
ROBBINS, Joseph M., 1st Lieut., Chicago, 10th Station Hospital, Camp Claiborne, La.
ROSACK, Henry, 1st Lieut., Chicago, 215th General Hospital, Fort Custer, Mich.
STAMLER, Maurice, 1st Lieut., Macon, Ill., Headquarters and Station Complement (Corps Area Service Command), Camp Wheeler, Ga.
VAN KIRK, Frank W., Jr., 1st Lieut., Chicago, Station Complement, Fort Custer, Mich.
WEISBACH, Philip, 1st Lieut., Chicago, 1st Medical Squadron, Fort Bliss, Texas.

Orders Revoked

BERGSTROM, Paul L., 1st Lieut., Kirkland, Ill., 29th Division, Fort Meade, Md.
HOLDEN, David, Lieut. Col., Chicago, 182d Field Artillery, Fort Leonard Wood, Mo.
KLIEGER, Samuel, 1st Lieut., Augusta, Mont., 33d Division, Camp Forrest, Tenn.

EIGHTH CORPS AREA

The following additional medical reserve corps officers have been ordered to active duty by the Commanding General, Eighth Corps Area, which comprises the states of Colorado, Arizona, New Mexico, Oklahoma and Texas:

ALBERT, Mayo William, 1st Lieut., Houston, Texas, 37th Engineer Regiment, Camp Bowie, Texas.
ARMSTRONG, John William, 1st Lieut., Houston, Texas, 45th Division, Camp Barkeley, Texas.
BEELER, George W., 1st Lieut., Texas City, Texas, Station Hospital, Fort Sill, Okla.
BLAIR, Drury Shelton, 1st Lieut., Dallas, Texas, Station Hospital, Fort Sam Houston, Texas.
BLOOM, Manuel Gordon, 1st Lieut., Houston, Texas, Station Hospital, Fort Bliss, Texas.
BOGUSKIE, William M., Captain, Hearne, Texas, Station Hospital, Fort Sill, Okla.
BOHMFALK, Stanley Wilbur, 1st Lieut., Wichita Falls, Texas, Station Hospital, Fort Huachuca, Ariz.
BRADEN, Albert Henry, Jr., 1st Lieut., Houston, Texas, 45th Division, Camp Barkeley, Texas.
BURNETT, Berry H., Lieut. Col., Englewood, Colo., Station Hospital, Fort Sam Houston, Texas.
COLVERT, James R., 1st Lieut., Oklahoma City, Station Hospital, Fort Sill, Okla.
COWAN, William Kenneth, 1st Lieut., Dallas, Texas, Station Hospital, Fort Sill, Okla.
DEBACKER, William, 1st Lieut., Boulder, Colo., Station Hospital, Fort Bliss, Texas.
De MEULES, Edgar A., 1st Lieut., Tulsa, Okla., Station Hospital, Fort Bliss, Texas.
DODSON, George Edward, 1st Lieut., Muskogee, Okla., 45th Division, Camp Barkeley, Texas.
DOYLE, William Henry, Captain, Muskogee, Okla., Station Hospital, Fort Sill, Okla.
DRANE, Hugh A., Jr., 1st Lieut., Corsicana, Texas, Corps Area Service Command, Camp Wolters, Texas.
FOWLER, Freeman D., 1st Lieut., Idaho Springs, Colo., 83d Field Artillery Battalion, Fort Sill, Okla.
FRIED, Bernard H., 1st Lieut., San Antonio, Texas, 55th Medical Battalion, Fort Sam Houston, Texas.
GARCIA, Robert E., 1st Lieut., Parker, Ariz., 36th Division, Camp Bowie, Texas.
HALL, Jos. Leslie, 1st Lieut., Stanton, Texas, Station Hospital, Fort Bliss, Texas.
HAMRA, Henry M., 1st Lieut., Phillips, Texas, Station Hospital, Fort Sill, Okla.
HARRIS, Joseph B., 1st Lieut., Midlothian, Texas, Station Hospital, Fort Sill, Okla.
HILL, Robert M., 1st Lieut., Kingsville, Texas, Reception Center, Camp Wolters, Texas.
HIXSON, William Cooper, 1st Lieut., Galveston, Texas, Station Hospital, Fort Crockett, Texas.
HODGES, Tom Wiley, 1st Lieut., Boston, Station Hospital, Fort Bliss, Texas.
HUNT, Walter Emmett, 1st Lieut., Graham, Texas, Hicks Field, Texas.
KING, Walter Blackburn, Jr., 1st Lieut., Waco, Texas, 46th Engineer Regiment, Camp Bowie, Texas.
McCOLLUM, Wiley Thomas, 1st Lieut., Waynoka, Okla., Station Hospital, Camp Wolters, Texas.
MERRIMAN, George J., Jr., 1st Lieut., Dallas, Texas, Station Hospital, Brooks Field, Texas.
MERRITT, William Henry, 1st Lieut., Denver, Station Hospital, Fort Sam Houston, Texas.
MITCHELL, Joseph Neal, 1st Lieut., Dallas, Texas, Station Hospital, Fort Sill, Okla.
MOONEY, Ken, 1st Lieut., Dallas, Texas, Station Hospital, Fort Sam Houston, Texas.
MUSMAN, David Jack, 1st Lieut., Denver, Station Hospital, Fort Bliss, Texas.
PICKETT, Taylor Thomas, Captain, Garland, Texas, Camp Wolters, Texas.
ROBINSON, Hampton C., Jr., 1st Lieut., Missouri City, Texas, Corps Area Service Command, Fort Sam Houston, Texas.
ROOSTH, Harold, 1st Lieut., Tyler, Texas, 349th Field Artillery, Fort Sill, Okla.
RUTHERFORD, Vester M., 1st Lieut., Woodward, Okla., 25th Infantry, Fort Huachuca, Ariz.
SCHENCK, Charles P., Major, Fort Worth, Texas, Selective Service System, Santa Fe, N. M.
SCOTT, Raymond E., Lieut. Colonel, San Antonio, Texas, Station Hospital, Fort Bliss, Texas.
SMITH, William L., 1st Lieut., Sonora, Texas, 1st Cavalry Division, Fort Bliss, Texas.
SORY, Crysup, 1st Lieut., Freer, Texas, District Recruiting Office, U. S. Army, Oklahoma City.
SPARK, Milton, 1st Lieut., Waco, Texas, Fort Bliss, Texas.
STOVALL, Sidney LaVerne, 1st Lieut., Dallas, Texas, Station Hospital, Fort Sam Houston, Texas.
WELLS, Benjamin S., 1st Lieut., Denver, Station Hospital, Fort Bliss, Texas.
WILLIAMSON, Lawrence M., 1st Lieut., Lindsay, Okla., Station Hospital Fort Sill, Okla.

Orders Revoked

ADLER, Stuart W., 1st Lieut., Albuquerque, N. M.
BATE, Thomas H., 1st Lieut., Phoenix, Ariz.
BEEBE, Milton, 1st Lieut., Fort Sam Houston, Texas.
BOGUSKIE, William M., Captain, Hearne, Texas.
BOURLAND, John Bookhout, 1st Lieut., Dallas, Texas.
BROWN, Alex, 1st Lieut., El Paso, Texas.
CAMPBELL, Robert P., 1st Lieut., San Antonio, Texas.
DANIEL, Alfred H., 1st Lieut., Brownfield, Texas.
De MEULES, Edgar A., 1st Lieut., Tulsa, Okla.
FARNESS, O. Jocevious, 1st Lieut., Tucson, Ariz.
FEAMSTER, Felix C., 1st Lieut., Fort Sam Houston, Texas.
FOWLER, Freeman D., 1st Lieut., Idaho Springs, Colo.
FRANCIS, James D., 1st Lieut., Tucson, Ariz.
GAULT, William H., 1st Lieut., Phoenix, Ariz.
GLATHAR, Albert W., 1st Lieut., Pueblo, Colo.
HOLLIS, Lynn E., 1st Lieut., Hollis, Okla.
HUGGINS, James R., 1st Lieut., Oklahoma City.
JACKSON, James E., 1st Lieut., Houston, Texas.
KELLAM, Seth W., 1st Lieut., Midland, Texas.
KELLY, Marcus G., 1st Lieut., Phoenix, Ariz.
KENNERLY, Thomas P., 1st Lieut., Houston, Texas.
KUYKENDALL, Fred D., 1st Lieut., Eaton, Colo.
McCARTY, David W., Jr., 1st Lieut., Longmont, Colo.
McCLURE, Wayne H., 1st Lieut., Kermit, Texas.
McMULLEN, James W., Major, Colorado Springs, Colo.
MARTIN, John D., 1st Lieut., Clint, Texas.
MILBURN, Kennedy A., Captain, San Antonio, Texas.
MILLIGAN, Gatewood C., 1st Lieut., Englewood, Colo.
NESTER, Charles R., 1st Lieut., Houston, Texas.
PICKETT, Britton E., Jr., 1st Lieut., Carrizo Springs, Texas.
PITT, Charles Kermit, 1st Lieut., Denver.
POWER, Paul H., Captain, Waco, Texas.
PROSSER, Moorman P., 1st Lieut., Norman, Okla.
REAGAN, Tom B., 1st Lieut., Beeville, Texas.
ROBERTS, Aaron L., Lieut. Colonel, Fort Worth, Texas.
RUTHERFORD, Vester M., 1st Lieut., Woodward, Okla.
SCHENCK, Charles P., Major, Fort Worth, Texas.
SCHILLER, Nelson L., Captain, Brenham, Texas.
SCHUBERT, Herbert A., 1st Lieut., Washington, D. C.
von POHLE, Charles L., 1st Lieut., Chandler, Ariz.
WELLS, Benjamin S., 1st Lieut., Denver.
WHEELER, Frank B., Jr., 1st Lieut., Winnsboro, Texas.
WILKOFF, Myron, 1st Lieut., Denver.
WOODALL, Jack M., 1st Lieut., Big Spring, Texas.
WOODSON, Orville M., 1st Lieut., Poteau, Texas.

NINTH CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, Ninth Corps Area, which comprises the states of Washington, Montana, Oregon, Nevada, Utah, California and Idaho:

ARONS, Joseph J., 1st Lieut., San Francisco, Camp Grant, Ill.
ASHER, Leonard M., 1st Lieut., Los Angeles, Fort MacArthur, Calif.
BERG, John A., 1st Lieut., Sacramento, Calif., Fort Ord, Calif.
BERGER, Melvin M., 1st Lieut., Los Angeles, Camp Grant, Ill.
BRAKEL, Carl A., 1st Lieut., Seattle, Wash., Camp San Luis Obispo, Calif.
BROTHERS, Ridgway H., 1st Lieut., Alameda, Calif., Basic Flying School, Tulare, Calif.
BULLOCK, Weldon K., 1st Lieut., Vernal, Utah, 1st Medical Regiment, Fort Ord, Calif.
BURG, Fred A., 1st Lieut., Fresno, Calif., Camp San Luis Obispo, Calif.
BURNS, George C., 1st Lieut., Compton, Calif., Fort MacArthur, Calif.
CADRANEL, Joseph L., 1st Lieut., Los Angeles, Medical Replacement Training Center, Camp Grant, Ill.
CHARTOCK, Abraham, 1st Lieut., San Francisco, Camp San Luis Obispo, Calif.
CHIAPELLA, Karl J., 1st Lieut., Chico, Calif., 3d Division, Fort Lewis, Wash.
CHINN, Silas, 1st Lieut., San Francisco, Camp Grant, Ill.
CHURCH, Claude H., Lieut. Col., Berkeley, Calif., 1st Military Area, Presidio of San Francisco.
COMBS, Robert C., 1st Lieut., San Francisco, Camp Sibert, Nev.
CREED, James W., 1st Lieut., Filer, Idaho, Fort Ord, Calif.
CROOKSTON, Wayne G., 1st Lieut., Salt Lake City, 9th Army Corps, Fort Lewis, Wash.
DARNELL, Clarence A., Captain, Hollywood, Calif., Camp Haan, Calif.
DEMAKOPOULOS, Nick, 1st Lieut., Stockton, Calif., Medical Replacement Training Center, Camp Grant, Ill.
FEDER, Bernard H., 1st Lieut., Los Angeles, Camp San Luis Obispo, Calif.
FINERMAN, Wilmore B., 1st Lieut., Los Angeles, Camp San Luis Obispo, Calif.
FIRPO, John J., 1st Lieut., San Francisco, Seventh Division, Fort Ord, Calif.
GALGIANI, John V., 1st Lieut., San Francisco, Camp Grant, Ill.
GLUKFIELD, Jerome P., 1st Lieut., San Francisco, Fort Worden, Wash.
GOLDSTEIN, Louis B., 1st Lieut., San Francisco, 1st Medical Regiment, Fort Ord, Calif.
GREENHOOD, Herbert, 1st Lieut., Oakland, Calif., Medical Replacement Training Center, Camp Grant, Ill.
HIGUCHI, James J., 1st Lieut., San Jose, Calif., Camp Grant, Ill.
HILL, Robert J., 1st Lieut., Whitehall, Mont., 40th Field Artillery, Camp Roberts, Calif.
KEY, Jules M., 1st Lieut., San Francisco, Medical Replacement Training Center, Camp Grant, Ill.
KOEHN, Carl L., Captain, Glendale, Calif., 3d Division, Fort Lewis, Wash.
LEVITT, Harry, 1st Lieut., Hollywood, Calif., Corps Area Service Command 1900, Surgeon's Office, pending assignment to Alaska.
LIM, KWONG, 1st Lieut., San Francisco, Camp Grant, Ill.
LIPOW, Eugene G., 1st Lieut., Dixon, Mont., Fort Lewis, Wash.
LONES, Frank E., 1st Lieut., Paso Robles, Calif., Camp Grant, Ill.
McNAUGHTON, James R, 1st Lieut., Los Angeles, Camp San Luis Obispo, Calif.
MALIA, John G., 1st Lieut., Vernal, Utah, Fort Ord, Calif.
MARQUIS, Harold H., 1st Lieut., San Francisco, 7th Division, Fort Ord, Calif.
MAYER, Leo L., 1st Lieut., Los Angeles, Camp Callan, Calif.
McDONALD, John B., 1st Lieut., Los Angeles, Camp San Luis Obispo.
McKIM, Charles P., 1st Lieut., Baker, Ore., Station Hospital, Fort Lewis, Wash.
McMILLAN, Thomas M., 1st Lieut., La Jolla, Calif., Camp Callan, Calif.
MELLOR, Wendell J., 1st Lieut., Idaho Falls, Idaho, Camp Roberts, Calif.
MENDELSON, Allan R., 1st Lieut., San Francisco, Camp Grant, Ill.
MICHELSON, Robin P., 1st Lieut., San Francisco, Annette Island, Alaska.
MOULTON, Rowland R., 1st Lieut., San Mateo, Calif., Camp San Luis Obispo, Calif.
MURPHY, Charles F., 1st Lieut., Pasadena, Calif., Camp San Luis Obispo, Calif.
NAHMAN, Morton S., 1st Lieut., San Francisco, Medical Replacement Training Center, Camp Grant, Ill.
NELSON, Harold O., 1st Lieut., Guadalupe, Calif., Camp Murray, Wash.
PALEVSKY, Samuel N., 1st Lieut., San Diego, Calif., 40th Field Artillery, Camp Roberts, Calif.
SALVAGGIO, Salvatore, Captain, Ontario, Ore., Camp Haan, Riverside County, Calif.
SCHOW, Floyd W., 1st Lieut., Hailey, Ida., 3d Division, Fort Lewis, Wash.
SEDGWICK, Frederick P., 1st Lieut., San Francisco, Camp Sibert, Nev.
SHAPIRO, Daniel A., 1st Lieut., San Francisco, Hamilton Field, Calif.
SHEPHARD, Hannibal C., 1st Lieut., Missoula, Mont., Camp Sibert, Nev.
SIMON, Stanley J., 1st Lieut., Los Angeles, Camp Grant, Ill.
WHITE, Almon J., 1st Lieut., Genesee, Ida., 9th Army Corps, Fort Lewis, Wash.
WHITE, Carroll W., 1st Lieut., LaVerne, Calif., 3d Army Corps, Presidio of Monterey, Calif.
YOUNG, Albert, 1st Lieut., San Francisco, Medical Replacement Training Center, Camp Grant, Ill.

Orders Revoked

TRUMP, Frank Austin, Captain, Ottawa, Kan.

Relieved from Active Duty

ARMOUR, Paul S., 1st Lieut.
AUTARD, Eugene J., 1st Lieut., Presidio of Monterey, Calif.
BLANKSTEIN, Samuel S., 1st Lieut., Milwaukee.
BOLTON, Leslie, T., Lieut. Col., Camp Roberts, Calif.
BRYANT, Frank A. M., Captain.
CLARK, Albert Guernsey, Major, San Francisco.
DIXON, Edward F., Captain, Camp Roberts, Calif.
FREDRICKSON, Clyde H., Lieut. Colonel.
GRAHAM, George Albert, 1st Lieut., Brooklyn.
GREENBERG, Irving Lawrence, 1st Lieut., Atlanta, Ga.
HANSEN, Alex Frederick, 1st Lieut.
MALIA, John G., 1st Lieut.
MANNING, John Joseph, 1st Lieut., Chicago.
MURPHY, Charles F., 1st Lieut., Camp San Luis Obispo, Calif.
NAUGLE, John Edward, 1st Lieut., Denver.
NETHERY, Robert D., 1st Lieut.
NEWMAN, Ernest Boris, 1st Lieut., Brooklyn.
NIELSON, Kenneth A., 1st Lieut., Camp Roberts, Calif.
NUTTER, Phosa David, 1st Lieut., Russellville, W. Va.
PERELSON, Harold N., 1st Lieut., Camp Callan, Calif.
PLATT, Samuel Sidney, 1st Lieut., Chicago.
PORTER, Reno Russell, 1st Lieut., Brookline, Mass.
REIERSON, Peter Albert, 1st Lieut., Chicago.
ROSENBLOOM, David, 1st Lieut., Fort Rosecrans, Calif.
ROYCE, Owen Bernard, 1st Lieut., Oklahoma City.
SLOAN, Leonard N., Major.
WHITE, Thomas Robert, 1st Lieut., Redland, Calif.
WHITE, William Luther, 1st Lieut., Philadelphia.

NATIONAL GUARD OFFICERS RELIEVED FROM ACTIVE DUTY

APPEL, James Ziegler, Captain, Lancaster, Pa.
ARCHER, Charles Andrew, Jr., 1st Lieut., Hodge, La.
BRETHOUWER, Norman Avery, Captain, Montrose, Colo.
CONNER, John Dutton, 1st Lieut., Nevada, Iowa.
DAHL, Harry Waldemar, Lieut. Col., Des Moines, Iowa.
FUNKE, Alvin Herman, Captain, Ashley, Pa.
GARBER, Jared Young, Captain, Lake Charles, La.
GLASSMAN, Edward Lewin, 1st Lieut., Baltimore.
HAUCK, Samuel Melvin, Captain, Lancaster, Pa.
LONG, Michael Richard, Captain, Lawrenceville, Pa.
MANDRACCHIA, John LePetrius, Major, New York.
MERENBLOOM, Derbert S., Captain, Cumberland, Ky.
MEYERS, Henry Albert, Major, Davenport, Iowa.
PASTOR, Louis Mordecai, Lieut. Col., Philadelphia.
PATTON, Samuel Ellsworth, Captain, Macon, Ga.
POPKY, Herman Bernard, 1st Lieut., Wilkes-Barre, Pa.
PREUSS, Charles August, Major, Santa Barbara, Calif.
TOWBIN, Samuel, Major, Denver.
WATT, Terrence Neal, 1st Lieut., Austin, Texas.
WHITING, Quinn A., 1st Lieut., East Ely, Nev.

ORDERED TO FOREIGN DUTY

ASHTON, Paul Louis, 1st Lieut., Corona, Calif., San Francisco, Fort William McKinley, Philippine Islands.
BERNASCONI, Ezio Joseph, Captain, Providence, R. I., Station Hospital, Borinquen Field, Puerto Rico.
FLEMING, Forest Elroy, Major, Los Angeles, Panama Canal Department, Quarry Heights, Balboa Heights, Canal Zone.
GAHM, Irvin George, 1st Lieut., Schofield Barracks, Hawaii, Fort Shafter, Hawaii, Wheeler Field, Schofield Barracks, Honolulu, Hawaii.
GOOD, Wealthy William, 1st Lieut., Station Hospital, 11th Medical Regiment, Schofield Barracks, Honolulu, Hawaii.
OPSAHL, Harold E., Captain, Brainerd, Minn., Station Hospital, Fort Amador, Balboa, Canal Zone.

ORGANIZATION SECTION

OFFICIAL NOTES

EXHIBITS FROM HEADQUARTERS

September 1-4.—Tri-State Fair, Parsons, Kan. (in cooperation with Labette County Medical Society):
Mechanical Nostrums.

September 1-5.—American Congress of Physical Therapy, Washington, D. C. (annual meeting):
Radio Interference.

September 2-4.—Rocky Mountain Medical Conference, Yellowstone National Park, Wyo. (third biennial):
The Doctor's Office.
Silicosis.

September 10.—Tongue River Hospital, Lame Deer, Mont. (U. S. Indian Service, U. S. Department of the Interior):
Tularemia.

September 10-12.—State Medical Society of Wisconsin, Madison (annual meeting):
Tularemia: Pathology.
Chemistry of the Sulfonamides.
Industrial Health.
Cutaneous Manifestations of Tuberculosis.

September 8-13.—Store Window Displays, Madison, Wis. (in cooperation with the State Medical Society of Wisconsin):
Information About Health.
Your Personal Health.
Heroes of Medicine.
A Pump Representing Normal Arteries and Hard Arteries.

September 15-19.—American Hospital Association, Atlantic City, N. J. (annual meeting):
Hospital Material.

September 16-18.—Michigan State Medical Society, Grand Rapids (annual meeting):
Barbiturates.

September 22-27.—Walker County Fair, Jasper, Ala. (in cooperation with Walker County Medical Society):
Mechanical Nostrums.
Prevention of Eye Injuries.

September 23-25.—Indiana State Medical Association, Indianapolis (annual meeting):
Chemistry of the Sulfonamides.

September 29-October 2.—Kentucky State Medical Association, Louisville (annual meeting):
Barbiturates.
Nutritionally Improved Flour.
Posture.
Silicosis.
Cutaneous Manifestations of Syphilis.

ADDRESSES BY THE PRESIDENT AND THE PRESIDENT-ELECT

Dr. Frank H. Lahey, President of the American Medical Association, has been scheduled to deliver the following addresses during September:

September 2—Rocky Mountain Medical Conference, Yellowstone National Park.

September 3-4—Idaho State Medical Association, Boise.

September 5—Oregon State Medical Society, Portland.

September 18—Connecticut Clinical Congress, New Haven.

September 30—Kentucky State Medical Association, Louisville.

Dr. Fred W. Rankin, President-Elect of the American Medical Association, has been scheduled to deliver the following addresses:

September 11—L. & N. Railway Surgeons, Lexington, Ky.

September 24—Indiana State Medical Association, Indianapolis.

September 29—Kentucky State Medical Association, Louisville.

MEDICAL ECONOMIC ABSTRACTS

SCHOOL HYGIENE AND PHYSICAL EDUCATION

Children have shared with the general population in improved health conditions during the past fifty years according to a recent report of the Federal Security agency of the United States Office of Education.[1] Not only has there "been a decided increase in height and weight of children of school age and of college students" during this period, but the death rate shows a remarkable decrease.

From 1868 to 1890 the death rates of children of school age (in Massachusetts) remained at about 8 per thousand between 5 and 9 years, about 3.8 between 10 and 14 years, and around 6 between 15 and 19. Since then there has been a steady decline of mortality to about 1.7 for the first group, 1.4 for the second and 1.8 for the third.

In part this is due to sanitation and general improvement of environmental conditions, although a previous study of this department showed that colleges and universities are more backward than public schools "in putting into practice what is known in this field." One of the weakest phases of school health care is education in hygiene, which is seldom given by specially trained teachers and "often falls below what might have been expected in content and method."

The effort to find some sort of measurements or tests by which to determine physical condition seems to have failed, because "always in such examinations the investigator is confronted with the extreme complexity of the human organism and with many other factors that must be taken into account."

Attempts to determine the results of health examinations and services to treat defects found meet with the same obstacle of individual differences, although recent statistics indicate that tuberculous infection is becoming less common. There is beginning to be some doubt as to whether wholesale provision of glasses is "always a blessing or at least an unmixed good."

There seems to be a tendency to vest the administration of school health services in educational authorities rather in health departments. "When it comes to the treatment of defects and diseases of children, the role of the school is not so clear, for it has never been its function to deal with the treatment of bodily ills."

FEWER DEATHS FROM APPENDICITIS AND SMALLPOX

The decline in mortality from appendicitis among those insured in the industrial department of the Metropolitan Life Insurance Company of 29.1 per cent for white males and 36.4 per cent for white females between 1929-1931 and 1938-1940 is credited to the fact that "The challenge of appendicitis has been met by educational compaigns in which were joined the efforts of the medical profession, life insurance companies, schools, civic organizations and druggists." It is held that this decline in the death rate is due to "two vital factors—prompt medical attention and avoidance of laxatives in the presence of abdominal pains."

The same issue of the Statistical Bulletin of the Metropolitan Life Insurance Company (June 1941) notes that there were only 2,839 reported cases of smallpox in 1940, which represents a

1. Rogers, James F.: School Hygiene and Physical Education, Biennial Survey of Education in the United States, 1938-1940, United States Printing Office, 1941.

drop of more than 70 per cent from the previous year. In a group of states on the Atlantic seaboard containing one fourth of our total population there was not a single case, while the large majority of the cases were concentrated in the North Central area and some of the Western states, where a large number of people minimize or ignore the efficacy of vaccination.

DOCTOR'S AUTOMOBILE

In a profession that is no respecter of time tables, says *Automobile Facts*, the physician's car is just about as much a part of his professional equipment as his stethoscope or his thermometer.

Because the hurry call to a patient's home may come at noon, midnight or dawn, the doctor must keep his medical kit ready and his car on hand twenty-four hours a day.

As a result, the medical man leads all occupational groups in the number of round trips rolled up annually.

His speedometer also ticks off more total miles in the course of a year than any other group, with the sole exception of traveling salesmen.

Residents of rural areas, who had been far from a doctor's service in the horse and buggy days, are especially aided.

Out of every 100 doctors who use their private automobiles for necessity transportation, it was found that:

Sixteen average more than 1,500 trips annually.

Fifteen make from 1,000 to 1,500 trips a year.

Ten reported from 800 to 1,000 round trips by car annually.

Twenty-eight range from 400 to 800 trips annually.

Twenty-two average from 200 to 400.

Only nine average fewer than 200 round trips a year for necessity driving.

For all car-owning physicians, the average number of round trips annually per car was found to be 947, of which 842 trips, or nearly 90 per cent of the total, were credited to necessity purposes.

Naturally, the length of the trips varies from a few blocks to many miles, depending on the doctor's location and the range of his practice.

Of all groups of car users, the doctors' cars rank next to the top, their average distance traveled in a year being 12,932 miles per car. And, according to surveys, necessity driving accounted for 8,640 miles of the total.

WOMAN'S AUXILIARY

Louisiana

The wives of the Ascension Parish doctors were invited to a "Coffee" given by Mrs. Rhodes Spedale of Plaquemine in honor of Mrs. Roy Carl Young, president of the Woman's Auxiliary to the Louisiana State Medical Society. Mrs. S. T. Martin suggested that Ascension Parish organize while Mrs. Young was present. Mrs. Young outlined aims and purposes of the auxiliary and procedure of organization followed. Mrs. D. T. Martin of Donaldsonville was elected president; Mrs. Percy LeBlanc, Donaldsonville, vice president; Mrs. M. Epstein of Gonzales, secretary and treasurer.

An organization meeting for wives of doctors of Acadia Parish was held at the home of Dr. and Mrs. J. P. Mauboules in Rayne.

Mrs. Roy Carl Young of Covington, state president, came to assist with the formation of the new organization.

Utah

The Salt Lake County medical auxiliary met March 17. Dr. Richard P. Middleton, president of the Salt Lake County Medical Society, spoke on the bills pertaining to medical practice which came before the state legislature this year. Mrs. Claude L. Shields talked on roses, Mrs. J. L. Jones on lily pools and Mrs. John Sugden on "New Faces in the Garden."

Virginia

The auxiliary to the Norfolk County Medical Society on March 25 decided to contribute $50 to the Norfolk Tumor and Cancer Control Clinic and to transfer to the treasury of the Tidewater Memorial Hospital $50 to be used for the next patient in the auxiliary bed. The auxiliary is helping with the Woman's Field Army Cancer Control drive with Mrs. Southgate Leigh Jr. as chairman. Mrs. C. J. Devine was appointed chairman for the Community Fund drive among the doctors. A short story on the doctor's wife was read by Mrs. C. M. McCoy. There was a luncheon in honor of Mrs. Griffin W. Holland, president of the state auxiliary. "Doctors' Day" was celebrated by presenting to the Norfolk County Medical Society a projector for use in showing slides at the medical meetings. During luncheon, a short fashion show was given with the doctors' wives acting as models.

The Woman's Auxiliary to the Northampton-Accomac Medical Society met April 1 at the home of Mrs. E. W. P. Downing of Frankton. The Hygeia chairman, Mrs. C. E. Critcher, reported that this magazine had been replaced in five more Accomac schools.

The state president, Mrs. Griffin W. Holland, introduced Mrs. E. Latane Flanagan, Richmond, president-elect of the state auxiliary, who spoke on "This Job of Ours." Following an election of delegates to the state meeting, there was an auction of foods for general funds.

Washington

Mrs. J. T. Rooks, radio chairman of the Walla Walla Valley auxiliary, has for the past two years organized radio health programs which are chosen in August from a list sent from the American Medical Association and are selected to cover the health needs of the community. Station KUJ in Walla Walla broadcasts these programs Tuesdays from August until May. These programs last year were declared one of the most popular broadcasts of KUJ.

West Virginia

The auxiliary to the McDowell County Medical Society met at the Appalachian Community Room, Welch. Mrs. Charles B. Chapman, the president, introduced Mrs. Chester Harman, who discussed Red Cross work. The auxiliary donated $10 to the Red Cross and Salvation Army each, $1 to the Jane Todd Memorial Fund and decided to send *Hygeia* to the Junior Woman's Club Library.

The Woman's Auxiliary to the Academy of Medicine of Parkersburg met at the Chancellor Hotel. Mrs. H. A. Giltner called the meeting to order. Mrs. V. E. Holcombe, then national auxiliary president, talked on *Hygeia* and the *Bulletin*.

Wisconsin

The Columbia-Marquette-Adams County auxiliary in Portage March 18 arranged to send a crippled child to "Wabeek," Wisconsin Dells, for two weeks this summer. Mrs. R. B. Dryer entertained the 22 members with a review of "Doc's Wife" by Faye Cosholt Lewis. Hostesses were the Sisters of St. Saviours Hospital.

The Fond du Lac County auxiliary in March planned parties to raise money for the Girl Scout Troop which the auxiliary sponsors. A musical program was presented by 4 members of the auxiliary: Mrs. L. J. Keenan, vocalist; Mrs. E. V. Smith Jr., violinist, and Mrs. S. A. Thiesen, accompanist. Mrs. E. L. Watson of Ripon presented a paper on "The Bible in Modern Literature." At their meeting in Fond du Lac in April, 29 members heard Miss Ruth E. Reber, dean of women and director of speech at Wayland Academy and Junior College at Beaver Dam, read "Life with Father."

A tea was held in LaCrosse in March by the LaCrosse County auxiliary, honoring Mrs. S. A. Montgomery, who left with her husband for Fort Sam Houston, Texas, in April. Mrs. Montgomery was the auxiliary's first president and one of its organizers and is now second vice president of the state organization.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Club Members Oppose Compulsory Sickness Insurance. — Members of the Commonwealth Club of California voted opposition to the "establishment by government of a system of compulsory sickness insurance" in a membership poll completed July 29, a release from San Francisco announces. To the question "Do you favor the establishment by government of a system of compulsory sickness insurance (health insurance)?" 871 members voted "No" and 491 members voted "Yes." Ballots on this question were mailed to all of the club's 4,400 members following a study by the public health section and publication of reports for and against the issue.

Well Baby Program.—The University of California Medical School, San Francisco, and the state department of health are cooperating in the expansion of child health work in the state. A step in the plan was the appointment of Dr. Sydney Sinclair, formerly instructor in pediatrics, Yale University School of Medicine, New Haven, as associate in pediatrics at California. Dr. Sinclair will spend part of his time teaching at the university and in addition he will be a pediatric "circuit rider," traveling over California as an agent of the state health department. He will act as a consultant for county medical societies, individual physicians and groups involved in the care of young children. The new plan is an extension of the postgraduate "well baby program" started more than a year ago, which is under the direction of Dr. Amos Christie, associate professor of pediatrics in the medical school.

Position Open as City Health Officer.—The city of Los Angeles is seeking qualified applicants for the position of city health officer paying a salary of $7,200 per annum. While the city charter requires that candidates for this position be residents of Los Angeles if possible, candidates who do not reside in the city may become eligible, provided they are otherwise qualified, if there is insufficient competition for this examination. From the experience of other agencies in this area it is probable that competition will be insufficient and that it will be necessary to waive the residence requirements. The city health officer is the chief administrative officer of the city health department and plans and administers a broad public health program, including medical and inspectional services. He is responsible for the proper enforcement of health laws and ordinances and the prevention and control of communicable disease in the city. Public health physicians who are interested in this position should communicate with the Los Angeles City Civil Service Commission, Room 11, City Hall, Los Angeles, for further information.

DISTRICT OF COLUMBIA

Citizenship as Prerequisite to Practice of Medicine.—The Medical Society of the District of Columbia has approved a proposed bill which would make American citizenship a prerequisite to the practice of medicine in the District. At present aliens are permitted to qualify for licenses to practice medicine in the District. Forty-four states have laws or regulations requiring medical applicants to be American citizens or holders of first naturalization papers. Exceptions are California, Indiana, Vermont and Arizona.

ILLINOIS

Personal. — Dr. Henry B. Knowles, until recently acting managing officer of the Anna State Hospital, Anna, has been named to a similar position at the Illinois Training School for Boys, St. Charles. —— Dr. Charles O. Highsmith, West Union, has been appointed a member of the Professional Committee for Medicine of the State Department of Registration and Education, filling a vacancy caused by the death of Dr. John R. Neal, Chicago, it is reported.

Three Amebiasis Carriers at State Fair.—Three food handlers at the recent state fair in Springfield were found to be amebic dysentery carriers and were relieved of their employment, August 12. The discovery was made following the report of a Springfield physician to the state department of health that he had diagnosed the illness of a patient from one of the traveling shows as amebic dysentery. The state department then took specimens from all crew members of the show, a group of about sixty persons, who had been in close contact with the patient. The three persons whose specimens were positive for the presence of the amebic dysentery organism were immediately removed from the state fair grounds. The patient's work involved the handling of refreshments either for the show crew or for the public.

Chicago

Wisconsin and Chicago Cooperate in Symposium.—The University of Wisconsin and the University of Chicago are cooperating in a joint symposium on the respiratory enzymes and the biologic action of the vitamins. The Wisconsin sessions, devoted to the respiratory enzymes, will be held September 11-13 and the meetings dealing with the vitamins will take place in Chicago, September 15-17. The symposium is sponsored jointly by the two universities with funds supplied by the Wisconsin Alumni Research Foundation and is the fifth held at Wisconsin and supported by the foundation during the past three years. At the Wisconsin sessions the speakers will include Dr. Otto Meyerhof, research professor of physiologic chemistry, University of Pennsylvania School of Medicine, Philadelphia, and Carl A. Neuberg, Ph.D., department of chemistry, New York University. Complete information may be obtained from Conrad A. Elvehjem, Ph.D., University of Wisconsin, Madison, or from Thorfin R. Hogness, Ph.D., University of Chicago.

INDIANA

Personal.—Dr. John D. Winebrenner, formerly of Muncie, has been made district health officer for the Indiana State Board of Health, Princeton, succeeding Dr. Wallace E. Childs, who has been assigned to active duty at Fort Knox, Ky., U. S. Army Medical Corps.

Indiana Has Vacancy for a Psychiatrist.—The Indiana State Personnel Division has announced examinations for senior clinical psychiatrist and psychiatric social worker to fill anticipated vacancies in the state department of public welfare. The deadline for filing applications is September 9. Information may be obtained from the Indiana State Personnel Division, 141 South Meridian Street, Indianapolis.

Changes in the Faculty.—Paul M. Harmon, Ph.D., who has been connected with the Indiana University School of Medicine, Indianapolis, for the past twenty-six years, has been named chairman of the department of physiology in the medical school, succeeding William J. Moenkhaus, Ph.D., who retired at the end of the past school year. Dr. Khalil G. Wakim, who has been teaching at the Mayo Clinic, Rochester, Minn., for the last year, has been appointed associate professor of physiology.

KANSAS

Meeting on Nutrition. — Gov. Payne H. Ratner has appointed a committee on nutrition as part of the national defense program. Margaret M. Justin, Ph.D., dean of the division of home economics, Kansas State College, Manhattan, is chairman of the committee and Dr. Paul E. Belknap, Topeka, the physician member. The group plans to hold its first annual meeting in Topeka on October 17-18, at which time a program covering various aspects of nutrition will be presented.

KENTUCKY

Society News.—Dr. John E. Haynes, Dawson Springs, discussed diagnosis and treatment of varicose veins at a meeting of the Hopkins County Medical Society, July 10, in Madisonville.——Dr. Charles William Dowden, Louisville, discussed vitamin therapy at the June meeting of the Henry County Medical Society.——Dr. Francis D. Willey, Jenkins, presented a paper on burns at a meeting of the Letcher County Medical Society, Whitesburg, July 29.

LOUISIANA

New Institute for Medical Research.—The Helis Institute for Medical Research has been created by a trust fund made available by William G. Helis of New Orleans to provide funds for the conduct of medical research and the advancement of the medical sciences. The institute intends to establish various clinical and experimental divisions at medical schools and hospitals, the first of which has already been set up as the Center of Research of Hotel Dieu Hospital. All research carried on at these centers will be financed by the institute. Dr. Carlo J. Tripoli, assistant professor of medicine, Louisiana State University School of Medicine, New Orleans, has been appointed director of the institute.

MICHIGAN

State Medical Meeting in Grand Rapids.—The Michigan State Medical Society will hold its seventy-sixth annual meeting at the Pantlind Hotel and the Civic Auditorium, Grand Rapids, September 16-19, under the presidency of Dr. Paul R. Urmston, Bay City. Out of state speakers will include:

Dr. Russell L. Cecil, New York, Arthritis—A Curable Disease.
Dr. Elliott C. Cutler, Boston (Dr. Stanley O. Hoerr, Boston, associate in study), Acute Appendicitis—A Twenty-Five Year Study.
Dr. Francis E. Senear, Chicago, Serologic Aspects of Syphilis.
Dr. George W. Kosmak, New York, The Medical and Other Implications Which Relate to An Aging Female Population.
Dr. Lawrence Kolb, Washington, D. C., The Needs and Possibilities of Research in Mental Disease.
Dr. Wesley Bourne, Westmount, Que., De Officiis in Anesthesia.
Dr. Anthony J. Lanza, New York, Medical Service in Small Industries.
Dr. Henry G. Poncher, Chicago, Hemorrhage in the Newborn.
Dr. James R. McCord. Atlanta, Ga., Some Obstetric Opinions.
Dr. Charles E. Lyght, Northfield, Minn., Some Educational Aspects of Diagnosing Tuberculosis Early.
Dr. Virgil P. W. Sydenstricker, Augusta, Ga., Factors in Deficiency Disease.
Dr. James L. Gamble, Boston, Pathogenesis of Acidosis and Alkalosis.
Dr. Borden S. Veeder, St. Louis, Child Health in National Defense.
Dr. William E. Caldwell, New York, Physiology and Management of the First Stage of Labor.
Dr. Alfred Cowan, Philadelphia, Some Observations on the Use of Glasses.
Dr. Shields Warren, Boston, Response of Tumors to Radiation.
Dr. Chester S. Keefer, Boston, Recent Advances in Chemotherapy of Infectious Diseases.
Dr. Arlie R. Barnes, Rochester, Minn., Problems in the Differential Diagnosis of Coronary Artery Disease.
Dr. Harry E. Mock, Chicago, Management of Skull Fractures.
Dr. Owen H. Wangensteen, Minneapolis, Management of Abdominal Injuries.
Dr. Richard W. TeLinde, Baltimore, Therapy of the Estrogens.
Dr. David E. S. Wishart, Toronto, Ont., Mistakes Made in the Diagnosis and Estimation of Deafness.
Dr. Samuel Iglauer, Cincinnati, Acute Suppuration in the Spaces of the Neck and motion picture demonstration: Approaches to the Surgical Spaces of the Neck.
Dr. Harold K. Faber, San Francisco, Cerebral Atrophy in Infants and Children.
Dr. Carroll S. Wright, Philadelphia, Therapeutic Effects of Vitamin B Factors in Dermatology.
Dr. Samuel William Becker, Chicago, Diagnosis and Treatment of Vesicular and Vesiculopustular Eruptions of the Hands and Feet.
Dr. Charles A. Doan, Columbus, Ohio, Relationship of the Reticuloendothelial System to Cellular and Humoral Immunity.

The program has been divided into general assemblies and sectional meetings. Friday morning there will be a symposium on traumatic surgery and a panel discussion on "Some Phases of the Cancer Problem," in which Dr. Bernard H. Nichols, Cleveland, is the guest speaker. Alphonse M. Schwitalla, S.J., dean of St. Louis University School of Medicine, St. Louis, will deliver the Biddle Oration on President's Night, Wednesday evening, on "The Code of Medical Ethics." A symposium on the business side of medicine has been arranged for Tuesday, September 16. Dr. Rosco G. Leland, Chicago, will lead a round table discussion at this session. The annual conference of secretaries, Wednesday, will be addressed by Mr. John M. Pratt, executive officer, National Physicians Committee, Chicago, on "What's Going On Nationally."

MISSOURI

Annual Clinical Conference.—The nineteenth annual fall clinical conference of the Kansas City Southwest Clinical Society will be held in Kansas City, October 6-9. The tentative program lists the following guest speakers:

Dr. Carl E. Badgley, Ann Arbor, Mich., Low Back Pain: Differential Diagnosis and Treatment of the Various Causative Factors.
Dr. William Dock, San Francisco, The Pathologic Physiology of Albuminuria and Nephrosis.
Dr. John W. Harris, Madison, Wis., Menopausal Bleeding: Causes and Treatment.
Dr. Verne C. Hunt, Los Angeles, Surgical Consideration of Carcinoma of the Stomach.
Dr. Philip C. Jeans, Iowa City, Relative Influence of Diet and Endocrine Disease in Growth.
Dr. Sara M. Jordan, Boston, Medical Management of Peptic Ulcer.
Dr. Samuel J. Kopetzky, New York, Treatment and Management of Otogenic Meningitis.
Dr. Ernest Perry McCullagh, Cleveland, Clinical Use of Testicular Hormones.
Dr. Henry O. Mertz, Indianapolis, Urinary Infections in Infants and Children.
Dr. John T. Murphy, Toledo, Ohio, X-Ray Treatment of Cancer of the Skin.
Dr. Fred W. Rankin, Lexington, Ky., President-Elect, American Medical Association, Diverticulitis of the Colon.
Dr. G. Canby Robinson, Baltimore, Nervous Indigestion.
Dr. Ernest Sachs, St. Louis, Recent Trends in the Treatment of Brain Injuries.
Dr. Roy W. Scott, Cleveland, The Part Played by Age, Cardiac Hypertrophy and Coronary Arterial Change in Heart Failure.
Dr. Henry P. Wagener, Rochester, Minn., The Grading and Grouping of Hypertensive Lesions in the Retina.

NEBRASKA

Postgraduate Course in Obstetrics and Pediatrics.—The University of Nebraska College of Medicine, Omaha, announces that it will conduct an extramural postgraduate course in obstetrics and pediatrics, September 8-22. The instructors will be Drs. Willis E. Brown, assistant professor of obstetrics, and John L. Gedgoud, assistant professor of pediatrics. Clinics will be held at the hospitals in the afternoon, and lectures will be presented in the evening with the exception of the program in Fremont, where only an evening meeting will be held. The dates and locations scheduled for the program are: Pender, September 8; Norfolk, September 9; Columbus, September 10; Beatrice, September 11; Falls City, September 12; Ogallala, September 15; North Platte, September 16; McCook, September 17; Kearney, September 18; York, September 19; Fremont, September 22. County and district medical societies are cooperating in the program with the state medical association, the state department of health and the university.

NEW JERSEY

Society News.—A joint meeting of the Bergen and Passaic county medical societies, September 11, in Paterson will be addressed by Drs. Charles H. Schlichter, Elizabeth, on "Medical Preparedness—the Physician's Duty in National Defense"; Norman M. Scott, Trenton, "An Analysis of the Work Done by the Physicians of the Draft Boards," and Col. Charles M. Walson, U. S. Army, "What the Army Expects of Civilian Doctors in the National Defense Program."

NEW YORK

Sulfathiazole Furnished to Physicians in New Gonorrhea Program.—The state department of health has begun the distribution of sulfathiazole to physicians, clinics and hospitals throughout upstate New York for use in the treatment of gonococcic infections, according to *Health News*. Packages of 40 tablets (0.5 Gm. each) may be obtained on request from regular laboratory supply stations which are now distributing the arsenicals and bismuth compounds for the treatment of syphilis. The questionnaire method will be used to assemble information on the incidence of gonorrhea in the state. A series of surveys are planned, the first of which was to be inaugurated this month. Physicians are urged to report to the state department of health patients who have failed to respond to treatment with sulfathiazole and who discontinue treatment before they are cured. The services of health department investigators will be made available for the return of such patients for further treatment.

New York City

Personal.—Dr. Enrique Washington Lithgow of the Hospital Padre Billini of Ciudad Trujillo, Dominican Republic, is the first physician to fill the fellowship created by the Dazian Foundation for Medical Research of New York City at the Mount Sinai Hospital for the benefit of physicians from the Latin-American republics.

Promotions at New York University.—Announcement is made by New York University College of Medicine of the following promotions:

Dr. Milton B. Rosenbluth, to be associate professor of clinical medicine.
Dr. Ludwig W. Eichna, assistant professor of medicine.
Drs. Claude E. Heaton, David N. Barrows and Arthur M. Reich, associate clinical professors of obstetrics and gynecology.
Drs. Myron E. Goldblatt, Herman H. Lardaro, Mortimer D. Speiser and Irwin Wellen, assistant clinical professors of obstetrics and gynecology.
Dr. Raymond E. Meek, assistant clinical professor of ophthalmology.
Dr. Harold Jacobziner, assistant clinical professor of pediatrics.
Dr. Lauretta Bender, associate professor of psychiatry.
Dr. Frank J. Curran, assistant professor of psychiatry.
Drs. Benjamin Apfelberg, Morris Herman, Sylvan Keiser, Charles B. Thompson and Herman I. Wortis, assistant clinical professors of psychiatry.
Dr. John H. Mulholland, professor of clinical surgery.
Dr. Samuel Standard, assistant professor of surgery.
Dr. Francis A. Echlin, assistant professor of surgery (neurosurgery).
Drs. Anthony S. Bogatko, Victor Carabba, Thomas J. Galvin, Meyer J. Kutisker, John A. Lawler, Joseph Nash, Irwin E. Siris and Hippolyte M. Wertheim, assistant professors of clinical surgery.

City Health Department Reorganized.—In a reorganization of the city department of health, the bureau of district health administration was discontinued, July 1, and the director transferred to the position of consultant in local administration. The major portion of the time of the consultant will be spent in the districts acting in an advisory and instructive capacity to the district health officers and assisting them in the development of programs. The former bureau of general administration is now called the office of general administration. The name of the bureau of records has been changed to the bureau of vital records and statistics. The central statistical division

has tentatively been placed under the deputy commission in charge of personnel. At present it includes only the statistical workers previously attached to the bureau of district health administration. Under the reorganization, the department of health now has the following ten bureaus: child hygiene; food and drugs; health education; laboratories; nursing; preventable diseases; sanitary bureau; social hygiene; tuberculosis, and vital records and statistics.

OHIO

Society News.—Dr. Walter M. Simpson, Dayton, will address the September meeting of the Summit County Medical Society, Akron, on "Fevers of Obscure Origin."——Dr. Richard D. Gill, Wheeling, W. Va., addressed the Guernsey County Medical Society, Cambridge, July 17, on "Obstruction of the Ureters."

OKLAHOMA

Activities of Public Health Personnel.—Dr. Lowell L. Stokes, Anadarko, health officer of the Caddo County health department, has been placed in charge of a newly created unit in Okmulgee County. Dr. Hugh H. Hawley Jr., Andarko, is now in charge of Caddo County. Dr. William A. Loy, director of the department at Ardmore and for the past year doing graduate work in public health at Harvard University, Boston, has been assigned to Cleveland County. Physicians who have spent the last year in graduate health study and who have returned to work with the state department of health include:

Frank P. Bertram, D.D.S., Oklahoma City, director of the dental division.
Dr. Harry E. Barnes, temporarily director of the Bryan County Health Department.
Dr. Vance F. Morgan, director of the Comanche County Health Department, Lawton.
Dr. Ferdinand H. Hassler Jr., director of laboratories, state department of health.

Dr. Lloyd H. Gaston of the U. S. Public Health Service has been assigned to work in Oklahoma as part of the cooperative policy planned in defense areas, the state medical journal reports.

OREGON

New Professor of Pathology.—Dr. Warren C. Hunter, since 1935 associate professor of pathology, University of Oregon Medical School, Portland, has been promoted to a full professorship. Dr. Hunter has been connected with the school since 1921.

Division of Mental Hygiene Established.—The state board of health has established a division of mental hygiene. Dr. Curtis R. Chaffin, Portland, of the U. S. Public Health Service is aiding in the work of setting up the new division, which will cooperate with the already existing facilities for mental hygiene in the state, according to a report in *Northwest Medicine*.

Crippled Children Program Transferred to Medical School.—*Northwest Medicine* announces that the administration of the state program for crippled children has been transferred from the State Public Welfare Commission to the University of Oregon Medical School, Portland. Dr. Richard B. Dillehunt, dean of the school, will continue as medical director.

PENNSYLVANIA

State Medical Meeting in Pittsburgh.—The ninety-first annual meeting of the Medical Society of the State of Pennsylvania will be held at the Hotel William Penn, Pittsburgh, October 6-9, under the presidency of Dr. Francis F. Borzell, Philadelphia. Guest speakers will include:

Dr. Louis A. Brunsting, Rochester, Minn., Sulfonamide Drugs in Dermatology.
Dr. Samuel W. Clausen, Rochester, N. Y., Prevention and Treatment of Vitamin Deficiencies in Children.
Dr. Joseph A. Johnston, Detroit, The Physical Aspect of the Adolescent Period.
Dr. Meredith F. Campbell, New York, Urinary Obstruction in Infants and Children.
Dr. Charles A. Waters, Baltimore, Has Preoperative Irradiation a Place in the Treatment of Renal Tumors?
Dr. Albert M. Snell, Rochester, Minn., Changing Conceptions of Portal Cirrhosis.
Dr. Maximilian A. Goldzieher, New York, Diagnosis and Treatment of Pituitary Disorders.
Dr. James L. Reycraft, Cleveland, Diagnosis and Treatment of Placenta Previa.
Dr. Virgil S. Counseller, Rochester, Minn., Influence of Infection on Abdominal Hysterectomy.
Dr. Edward S. Welles, Saranac Lake, N. Y., Surgery in the Presence of Diabetes.
Dr. Leland S. McKittrick, Boston, Surgery in the Presence of Diabetes.
William Mather Lewis, selective service director, state of Pennsylvania, Medical Choice of Selectees—From the Viewpoint of the Pennsylvania Selective Service Board.
Dr. William L. Benedict, Rochester, Minn., Surgical Treatment of Glaucoma.
Dr. Thomas C. Galloway, Evanston, Ill., Upper Respiratory Tract Obstructions and Their Secondary Effects.
Dr. Charles Gordon Heyd, New York, Common Errors in Selection of Patients for Surgery.
Dr. Edward J. Stieglitz, Garrett Park, Md., Problems of the Aging.
Dr. Charles A. Doan, Columbus, Ohio, More Common Blood Dyscrasias —Their Diagnosis and Treatment.

There will be three morning general assemblies, round table conferences featuring question and answer periods, and afternoon sectional meetings.

Philadelphia

Personal.—Dr. William G. Leaman Jr. has been appointed clinical associate professor of medicine at the Woman's Medical College of Pennsylvania and visiting physician at the Philadelphia General Hospital. In the latter position he succeeds the late Dr. Robert G. Torrey.

RHODE ISLAND

Fiske Prize Essay.—"Chemotherapy—Its Clinical Application" has been chosen as the subject for the Fiske Fund prize essay for 1942, it was announced at the recent annual meeting of the Rhode Island Medical Society. The author of the winning essay will receive $250. Additional details may be obtained from Dr. Wilfred Pickles, 184 Waterman Street, Providence, secretary to the trustees of the Fiske Fund.

TENNESSEE

National Youth Health Program.—The nationwide health project of the National Youth Administration for youths aged 17 to 25 years who are enrolled in the out of school work program is being organized in Tennessee. Examining physicians and dentists will be appointed in each county to secure examinations of the youths. For this service the administration will pay for office examinations. Dr. John M. Lee, Nashville, has been appointed state health director to organize and direct the program in Tennessee. The state administrator of the NYA has appointed the following to act as a medical advisory committee: Drs. Harrison H. Shoulders, chairman; Charles M. Hamilton, Leonard W. Edwards, Wilson Carter Williams and Dr. Lee. All are from Nashville.

TEXAS

Executive Director for Group Hospital Service.—Walter R. McBee, executive director of Group Hospital Service of Oklahoma, has been appointed to a similar position with the state group in Texas. He was admitted to the Missouri bar in 1924. He has worked with the Federal Board for Vocational Education and the U. S. Veterans' Bureau, the American Credit Indemnity Company, and the Group Hospital Service of St. Louis.

Society News.—Drs. Charles T. Kennedy and Joseph D. Becton, Greenville, addressed the Hunt-Rockwall-Rains Counties Medical Society in Wolfe City, August 12, on typhoid and on abdominal surgery, respectively.——Dr. George B. Stephenson, Beaumont, addressed the Jefferson County Medical Society in Beaumont, July 14, on "Low Back Pain."——At a meeting of the Hidalgo-Starr Counties Medical Society in Edinburg recently the speakers were Drs. Edith M. Bonnet on "Significance of Tuberculin Testing in Childhood" and Roy G. Giles, "An Evaluation of the X-Ray in the Diagnosis of Pulmonary Tuberculosis"; both are of San Antonio.

Changes in Health Officers.—Dr. Harold C. Shilling, Fort Worth, has been made director of the Hunt County health unit, replacing Dr. Henry C. Wilson, Greenville, who has been appointed to the Tyler-Smith counties health unit. Dr. Wilson succeeds Dr. Robert L. Cherry, Tyler, who has been appointed field director for the county health units for the state department of health.——Dr. John H. Finn, Refugio, was recently appointed health officer of Refugio County, succeeding Dr. Haddon B. Woods, who has been called to service in the army. ——Dr. Bennett A. Wight, Kermit, has been placed in charge of the Gregg County Health Department.——Dr. Sylvester S. Munger has been named city health officer of Marlin.

WEST VIRGINIA

Society News.—Dr. Richard J. Stevens, Huntington, addressed the Logan County Medical Society, Logan, recently on "Hemorrhages in the Gastrointestinal Tract."——Dr. Walter B. Martin, Norfolk, Va., addressed the Mercer County Medical Society, Tazewell, recently, on "Cardiac Decompensation."——Sidney S. Negus, Ph.D., Richmond, Va., addressed a recent meeting of the Fayette County Medical Society and its Woman's Auxiliary at Oak Hill on "Pseudochemistry in Medicine."

GENERAL

New Radiologic Society.—The Rocky Mountain Radiological Society was organized during the midsummer radiologic conference of the Denver Radiological Club in Denver, July 31-August 2. There are forty-two charter members. Officers include Drs. Leonard G. Crosby, Denver, president, and Alfred M. Popma, Boise, Idaho, secretary. The 1942 annual meeting will be in Denver.

Gold Watch Found.—A letter received from the editor of the Plainfield, N. J., *Courier-News* indicates that a gold watch was found recently in the stomach of a weakfish which was opened in an A. & P. store in that city. The watch bore the following inscription: "Jim Cook, A. M. A." The New Jersey authorities are interested in determining whether or not this related to any one associated with the American Medical Association.

The Poliomyelitis Situation.—The opening of schools in Pennsylvania has been postponed on account of the spread of poliomyelitis. Up to August 29 eighteen deaths had been reported and more than 250 cases were confined to the eleven eastern and central counties in the state. The occurrence of three new cases in Philadelphia and eight in other counties led to additional restrictions, it was stated. Newspapers reported, August 31, that more than 60 cases had occurred in Passaic and Bergen counties, N. J., in the preceding two months. Two deaths in the Bergen Pines Isolation Hospital on August 24 were ascribed to the disease. In the previous twenty-five days 11 cases of the disease and one death were reported in the Paterson City Hospital. Opening of schools has been postponed in Passaic County and in Hackensack and Ridgewood in Bergen County. In Illinois the number of cases was 133, August 26, as against a total of 62 up to the same date in 1940.

International College of Surgeons.—Dr. Desiderio Roman, Philadelphia, was named president-elect of the International College of Surgeons at the international assembly in Mexico City, August 16, and Dr. Fred H. Albee, New York, was inducted into the presidency. Vice presidents are Drs. Chevalier L. Jackson, Philadelphia; Manuel A. Manzanilla, Mexico City; Herman de Las Casas, Caracas, Venezuela; Alex Stanischeff, Sofia, Bulgaria, and A. M. Dogliotti, Catania, Italy. Dr. Max Thorek, Chicago, is the international executive secretary. Dr. Thomas A. Shallow, Philadelphia, was chosen president of the U. S. chapter; Drs. Raymond W. McNealy, Chicago, and James R. Jaeger, vice presidents; Benjamin I. Golden, Elkins, W. Va., treasurer; Charles H. Arnold, Lincoln, Neb., executive secretary, and George H. Gillen, Denver, secretary of the scientific assembly,

National Safety Congress.—The thirtieth National Safety Congress and Exposition will be held at the Stevens Hotel, Chicago, October 6-10. One session, Tuesday morning, on industrial health will be addressed by Dr. Clarence D. Selby, medical consultant, General Motors Corporation, Detroit, on "National Defense Brings an Improved Industrial Hygiene Program"; Dr. John J. Brandabur, assistant supervising surgeon, Chesapeake & Ohio Railway Company, Huntington, W. Va., "Effective Industrial Health Education," and Myron A. Snell, supervising engineer, Hartford Accident & Indemnity Company, Hartford, Conn., "Essentials of Healthful Industrial Environment." Included among the speakers at the all day session on industrial nursing will be Dr. Henry H. Kessler, medical director, New Jersey Rehabilitation Clinic, Newark, on "Community Resources of the Industrial Nurse" and Dr. Paul A. Brehm, supervisor, industrial hygiene division, Wisconsin State Board of Health, Madison, "What the Nurse Can Do to Combat Absenteeism Caused by Illness and Injury."

Southern Tuberculosis Conference.—The North Carolina Tuberculosis Association will be host to the Southern Tuberculosis Conference in Asheville, N. C., September 15-17, at the George Vanderbilt Hotel, Dallas, Texas. At the general sessions the following will speak:

Dr. Julian A. Moore, Asheville, Isolation of the Open Case.
Dr. Robert J. Reeves, Durham, N. C., Laminography.
Dr. Raymond Hussey, Baltimore, Pulmonary Tuberculosis in Industry.
Dr. Champneys H. Holmes, Atlanta, Ga., Tuberculosis in the Aged.
Drs. Joseph R. Blalock and James B. Funkhouser, Marion, Va., Tuberculosis in Mental Hospital.
James P. Faulkner, Atlanta, Ga., Social Service and Occupational Readjustment for the Tuberculous.
Dr. Reuben Alec Brown, New Orleans, Report of the Chairman of State Directors of Tuberculosis Control.

The banquet will be addressed Monday night, among others, by Drs. Henry Franklin Carman, Dallas, Texas, president of the conference, on "Rehabilitation," and Eugene L. Bishop, Chattanooga, Tenn., "The Tennessee Valley Authority as a Health Agency."

FOREIGN

Personal.—Dr. Ernest Muir, medical secretary of the British Empire Leprosy Relief Association, has gone to take charge of the Chacachacare Leper Asylum in Trinidad for eighteen months, according to the *Lancet*.——Lord Horder has been appointed personal adviser to the Minister of Food, Lord Woolton, on medical aspects of the food problem.

Research Professorship Endowed.—The Royal College of Surgeons, London, has received £40,000 from the Bernard Baron trustees to endow a Bernard Baron research professorship at the college, according to *Science*. A letter addressed to the president of the college by the trustees reads in part:

The scientific work which has formed such a notable part of the activities of the Royal College of Surgeons of England must and will continue. The trustees realize, however, that one of the essential sinews of your and their endeavor to benefit mankind is the provision of funds for the prosecution of research. They have therefore decided to make a gift of £40,000 for the endowment of a Bernard Baron research professorship at the Royal College of Surgeons, so that, whatever the difficulties with which the council may be faced in other directions, research will not suffer.

Government Services

Changes in Public Health Service

The following changes appeared among others in official orders issued by the U. S. Public Health Service recently:

Medical Director Frank M. Faget, relieved at Stuttgart, Germany, July 1, and ordered to Lisbon, Portugal, for duty at the American Consulate.

Asst. Surg. Albert N. Sarwold, relieved at San Francisco, August 15, and ordered to the U. S. Quarantine Station, Manila, P. I.

New Consultant in Industrial Hygiene

Dr. William J. McConnell, assistant medical director, Metropolitan Life Insurance Company, reported for duty on August 7 as a consultant to the division of industrial hygiene, National Institute of Health, Bethesda, Md. He will direct the procedure to be used in the nationwide survey of present day medical service facilities in industry. Dr. McConnell graduated at St. Louis University School of Medicine, St. Louis, in 1914.

Psychiatric Nursing Consultant Appointed

The U. S. Public Health Service has appointed Miss Mary E. Corcoran, former superintendent of nurses at the New Jersey State Hospital at Greystone Park, to be psychiatric nursing consultant in the section on mental health methods, effective September 1. The section on mental health methods operates a survey service for mental hospitals and assists in the establishment of state mental hygiene-public health programs.

Malaria Project in China

A group of sixteen persons has been assigned by the U. S. Public Health Service to protect the health of 250,000 Chinese workmen building a railroad to parallel the Burma road through 300 malaria-infested miles in China, newspapers reported on August 16. The unit was formed at the request of the Chinese government and will be in charge of Dr. Victor H. Haas, passed assistant surgeon, U. S. Public Health Service. Dr. Haas and D. E. Wright, sanitary engineer of the Rockefeller Foundation, were to leave San Francisco for China on August 23 to launch the project. Others who will serve on the program include Dr. Marshall C. Balfour of the International Health Board of the Rockefeller Foundation; Dr. Thomas H. Tomlinson Jr., passed assistant surgeon, public health service; William L. Jellison, an entomologist stationed at the public health service laboratory in Hamilton, Mont.; Fred W. Thomas and Edward R. Lacey, sanitary engineers lent by the Tennessee Valley Authority; Gordon Smith, entomologist of the Tennessee Valley Authority; Dr. Fred P. Manget, Methodist missionary, who will supervise medical care of laborers, and Dr. Paul H. Stevenson of the Rockefeller Foundation, who has been working with medical centers and hospitals in China for twenty years. It is said that the group will be known as the Medical Commission to the Burma-Yunnan Railroad. The public health service and the foundation will pay the salaries of their men on the project, and the U. S. government has allocated $1,150,000 of lease-lend funds to the work.

Foreign Letters

LONDON

(From Our Regular Correspondent)

July 5, 1941.

Deliberate Attacks on Hospital Ships: Enemy Hospital Ship Detained as a Hostage

Since the outbreak of war the government has been faced with the difficult problem of how to deal with violations of the Red Cross. Retaliation is of course out of the question. But an Italian hospital ship has fallen into our hands and provided a hostage. The government has defined its action as follows: On July 12, 1940 it made a protest to the German government through the United States government against thirty-one flagrant attacks by aircraft and shore batteries on British hospital ships and carriers. Many of these hospital ships were severely damaged and three—the *Maid of Kent*, the *Brighton* and the *Paris*—were sunk. All these sinkings and at least half the other attacks took place in broad daylight. All the ships concerned were marked in accordance with the Hague convention.

Recently the commander in chief of the Mediterranean fleet has reported three attacks on hospital ships. On April 14, the hospital ship *Vita* with over 400 casualties on board was bombed by aircraft and badly damaged. While in tow the *Vita* was again attacked on April 21 and 22. On May 5 the hospital ship *Kapara* was bombed and damaged by at least nine enemy aircraft at Mersa Tobruk. On May 17 the hospital ship *Aba* was twice bombed and damaged south of Crete. Attacks were also made on Greek hospital ships.

The British government, it was said, is not prepared to tolerate such flagrant violations of a convention which has been signed and approved by the German and Italian governments and from which these, by marking their vessels, are receiving full advantage. It has therefore directed that an Italian hospital ship, which was intercepted and examined in accordance with the Hague convention, shall be detained and employed as a hospital ship for the transport of British and enemy sick and wounded. If attacks on British hospital ships cease, the return of the hospital ship will be considered.

Anti-Gas Precautions

Precautions continue to be taken against an attack by poison gas. The Ministry of Health has distributed to every householder a pamphlet "What to Do About Gas." Uninjured civilians contaminated by blister gas are told to take off any splashed outer garments at once and then go home or to the nearest private house or other place where they can wash. If they are more than five minutes from such a place it is the duty of the wardens or police to tell them what to do and, if appropriate, direct them to the nearest public cleansing center. The service departments have agreed that any sailor, soldier or airman who is grossly contaminated by liquid gas when away from his unit shall act in accordance with these instructions for civilians. At a public cleansing center he should be dressed and clothed in the same way as a civilian and instructed to report to the nearest unit for his service, which will return the borrowed clothes.

The Ministry of Food has issued directions for the protection of food against contamination by poison gas. The problem of protecting medical supplies presents some special problems, which have been dealt with in a circular issued by the Ministry of Health. The normal conditions of storage in warmed and ventilated buildings should provide for most articles all that is practicable in protection against liquid contamination. Some additional protection may be afforded by waterproof sheeting, batiste, cellophane or other impermeable material. Surgical dressings wrapped in paper, cardboard or cartons should not become contaminated by exposure to vapor, provided the wrappings are undamaged. Traces of vapor can be removed by opening them out and airing them. Where means are available, sterilization might be undertaken. If contaminated by liquid, it is doubtful whether any decontamination would be successful, and destruction by burning may be unavoidable. Vapor contamination of rubber materials can be removed by airing; liquid contamination, by immersion in boiling water for one to three hours. But the finest grade of rubber materials, such as catheters and surgeons' gloves, are unlikely to stand boiling and, if contaminated by liquid, should be destroyed. Covering to prevent such contamination is therefore desirable. Metal instruments can be decontaminated by immersion for thirty minutes in boiling water or by repeated swabbing with solvent.

Electroencephalographic Changes in Head Injuries

At the Neurological Section of the Royal Society of Medicine Squadron Leader Dennis Williams (medical officer of the air force) described the electroencephalographic changes which he had found after head injuries. He divided them into those occurring immediately after the injury and those observed in the chronic post-traumatic state, which might last for years. Three forms of abnormality were observed: (1) large slow waves with a period and amplitude related to the severity of the injury, (2) absence or diminution of the normal frequencies and (3) during the period of recovery shortly after the injury outbursts of high voltage sine waves like subclinical epileptic attacks. Slides were used to show progressive recovery of the electroencephalogram which closely followed clinical improvement. Records taken within twelve hours of simple concussion were normal, in contrast to gross abnormalities found in more severe head injuries. The disturbance was initially generalized, but as improvement took place areas of maximal abnormality were found. These coincided with areas of direct cerebral trauma by bomb fragments, with depressed fractures and with physical signs of corresponding cerebral damage, but they were found also in silent areas. In cases of mental changes characteristic of the frontal lobe syndrome electroencephalographic changes were found only in the frontal poles. It was concluded that in the acute post-traumatic state the electroencephalogram accurately reflected the degree of cerebral damage.

Investigation of the chronic post-traumatic state showed that half the patients had an abnormal electroencephalogram in contrast to 3 per cent for normal flying crews. There was a positive correlation between the length of post-traumatic amnesia and the percentage abnormality of the electroencephalogram. While almost every patient with dural penetration had an abnormal electroencephalogram, almost all who were free from symptoms had none. It was concluded that in most cases an abnormal electroencephalogram after a head injury is a direct result of organic cerebral damage and that the chronic post-traumatic syndrome of headaches, vertigo, loss of concentration, undue fatigue, mood changes and alteration in personality is usually organic in origin when the electroencephalogram is abnormal.

Marriages

ERNEST BOSTELMAN to Mrs. Geraldine Olson, both of Fort Myers, Fla., in Nashville, Tenn., recently.

JAMES H. CODDINGTON, Humboldt, Iowa, to Miss Betty Isaacson of Fort Dodge, at Wraywood, July 6.

ALEXANDER BRYCE STEARNS, Manchester, Iowa, to Miss Doris Young of Cedar Rapids, July 5.

Deaths

Max Aaron Goldstein ✠ St. Louis; Missouri Medical College, St. Louis, 1892; past president of the American Academy of Ophthalmology and Otolaryngology, American Otological Society and the American Laryngological, Rhinological and Otological Society; past president of the American Speech Correction Association and the National Forum on Deafness and Speech Pathology; member of the American Laryngological Association; fellow of the American College of Surgeons; served during the World War; professor of otology and director of the laboratory of clinical microscopy, Beaumont Hospital Medical College, from 1896 to 1901; professor of otology, Marion Sims Beaumont College of Medicine, from 1901 to 1903; professor of otology, St. Louis University School of Medicine, from 1903 to 1908 and professor of ear, nose and throat diseases from 1908 to 1911; in 1933 received the second annual St. Louis Award in recognition of his research in dealing with the problems of the deaf; founder and director of the Central Institute for the Deaf; director of the department of otolaryngology, Jewish Hospital for many years; founder and editor of the *Laryngoscope;* in 1937 received the honorary degree of doctor of laws from the Washington University; aged 71; died, July 27, in Frankfort, Mich., of cerebral hemorrhage.

Warren Robert Rainey ✠ St. Louis; Northwestern University Medical School, Chicago, 1910; assistant professor of clinical surgery at the Washington University School of Medicine; member of the American Proctologic Society; fellow of the American College of Surgeons; served during the World War; aged 54; proctologist, Robert Koch Hospital; surgeon, St. Luke's Hospital; assistant surgeon, Jewish Hospital; clinical assistant, St. Louis Children's and the Barnes Hospital, where he died, July 28, of Rocky Mountain spotted fever.

Dwight Chester Nelson, Kiulungkiang, Yunnan, China; University of Colorado School of Medicine, Denver, 1935; a medical missionary; director of the Presbyterian Hospital; formerly with the United States Public Health Service; at one time assistant in biology, embryology and research technician in the department of physiology, pharmacology and medicine at his alma mater; formerly clinical director and head of the neuropsychiatric service in the United States Northeastern Penitentiary, Lewisburg, Pa.; aged 33; was drowned, July 5.

Norman Clyde Baker ✠ Boston; Jefferson Medical College of Philadelphia, 1908; secretary of the Massachusetts Hospital Association from 1936 to 1940; served during the World War; aged 58; superintendent of the Newport (R. I.) Hospital from 1922 to 1926; assistant director of the Massachusetts General Hospital, where he died, July 31, of arteriosclerosis and coronary thrombosis.

Emmett F. Cook ✠ St. Joseph, Mo.; American Medical College, St. Louis, 1897; an Affiliate Fellow of the American Medical Association; past president and secretary of the Buchanan County Medical Society; served during the World War; member of the state legislature; aged 68; died, July 22, in the Missouri Methodist Hospital of heart disease and cerebral hemorrhage.

Raleigh William Baird ✠ Dallas, Texas; Bellevue Hospital Medical College, New York, 1896; at one time professor of clinical medicine at Baylor University College of Medicine; fellow of the American College of Physicians; for many years president of the Dallas Medical and Surgical Clinic and Hospital; on the staff of the Baylor University Hospital; aged 71; died, July 13.

Norman Thomas McLean ✠ Medical Director Captain, United States Navy, retired, Pearson, Md.; Tufts College Medical School, Boston, 1900; fellow of the American College of Surgeons; entered the navy in 1904 and retired in 1934 for incapacity resulting from an incident of service; aged 65; died, July 26, in the United States Naval Hospital, Washington, D. C.

Elmer Harrison Ormsby ✠ Amsterdam, N. Y.; Albany Medical College, 1913; past president of the Medical Society of the County of Montgomery; secretary-treasurer of the New York State Association of School Medical Inspectors; school physician; chief examiner of a draft board; served during the World War; aged 51; died, July 17, of acute cholangitis.

Archibald McIntyre Strong ✠ New York; Columbia University College of Physicians and Surgeons, New York, 1908; member of the French Hospital ambulance staff during the World War; served with the American Red Cross commission in Serbia in 1915; for many years on the staff of the Presbyterian Hospital; aged 60; died, July 21.

Stanley Haviland Martin, Richmond, Va.; Queen's University Faculty of Medicine, Kingston, Canada, M.B. in 1915 and M.D. in 1926; member of the Kentucky State Medical Association; formerly medical missionary in Korea and Manchuria for the United Church of Canada Mission; aged 51; died, July 24, of rheumatic heart disease.

Clement Laird Vallandigham Bell, Norwalk, Ohio; Homeopathic Hospital College, Cleveland, 1888; served during the World War; for many years county coroner; formerly health commissioner of Norwalk; aged 77; died, July 7, in the Veterans Administration Facility, Brecksville, of carcinoma of the prostate.

George Casper Bartley, Escanaba, Mich.; Milwaukee Medical College, 1910; member of the Michigan State Medical Society; formerly acting assistant surgeon in the United States Public Health Service; for many years member and president of the board of education; aged 56; died, July 13, of acute myocarditis.

Richard Franklin Slaughter ✠ Augusta, Ga.; University of Virginia Department of Medicine, Charlottesville, 1930; professor of neurosurgery at the University of Georgia School of Medicine; aged 34; died, July 4, in the Johns Hopkins Hospital, Baltimore, of brain abscess and cranial osteomyelitis.

Charles R. Silverthorne, Woodward, Okla.; University of the South Medical Department, Sewanee, Tenn., 1898; member of the Oklahoma State Medical Association; formerly physician in charge of the Woodward General Hospital; aged 70; died, July 27, in Bakersfield, Calif., of cerebral hemorrhage.

Hiram Leslie Reckard, Baltimore; Baltimore Medical College, 1895; for many years on the staff of the Presbyterian Eye, Ear, Nose and Throat Charity Hospital and the Church Home and Infirmary; aged 69; died, July 26, in the University Hospital of uremia following prostatic obstruction.

Morris Fellman ✠ Weehawken, N. J.; Syracuse University College of Medicine, 1925; consulting surgeon at the Margaret Hague Maternity Hospital and attending surgeon at the Jersey City Medical Center, Jersey City; lieutenant commander, United States Navy Reserve; aged 43; died, July 13.

Lester Lawrence Smith ✠ Assistant Surgeon, United States Public Health Service, Seattle; University of Illinois College of Medicine, Chicago, 1939; on the staff of the U. S. Marine Hospital; aged 28; was drowned, July 5, in the Russian River near Guerneville, Calif.

Murray B. McGonigle ✠ Toledo, Ohio; Ohio Medical University, Columbus, 1900; member of the American Urological Association; served during the World War; on the staffs of the Toledo and Mercy hospitals; aged 67; was found dead, July 29, of a self-inflicted bullet wound.

Thomas Francis Plunkett ✠ Derby, Conn.; Long Island College Hospital, Brooklyn, 1908; chairman of the board of education; formerly health officer and school physician; aged 60; on the staff of the Griffin Hospital, where he died, July 20, of coronary thrombosis.

Charles B. J. Mittelstaedt, Kingston, N. Y.; Bellevue Hospital Medical College, New York, 1896; served during the World War; aged 69; on the staff of the Kingston Hospital, where he died, July 25, of diverticulum of the bladder, gastric ulcer and myocarditis.

Alfred Charles Smith, Brockton, Mass.; Tufts College Medical School, Boston, 1898; at one time secretary and treasurer of the Plymouth District Medical Society; member of the Massachusetts Medical Society; aged 71; died, July 15, of coronary thrombosis.

Lawrence Norman Breene, Farrell, Pa.; Medico-Chirurgical College of Philadelphia, 1912; member of the Medical Society of the State of Pennsylvania; aged 54; died, July 19, in the Veterans Administration Facility, Aspinwall, of Friedreich's ataxia.

Benjamin Sidney Chapman, Montgomery, Ala.; University of the City of New York Medical Department, 1892; member of the Medical Association of the State of Alabama; for many years school physician for the city health department; aged 71; died, July 15.

Abraham Joseph Hurwitz, Boston; Tufts College Medical School, Boston, 1902; member of the Massachusetts Medical Society; on the staff of the Beth Israel Hospital and the Boston Dispensary; aged 65; died, July 30, of angina pectoris and myocarditis.

Harry Graves Bevington, Detroit; Cleveland Homeopathic Medical College, 1898; member of the Michigan State Medical Society; served in various capacities on the staff of

the Grace Hospital; aged 64; died, July 15, of coronary thrombosis.

Wallace Steele Bryan ✠ Ramey, Pa.; Jefferson Medical College of Philadelphia, 1906; past president of the Clearfield County Medical Society; for many years president of the board of education; aged 63; died, July 20, of coronary thrombosis.

Charles Frederick Pinkerton, Salt Lake City; John A. Creighton Medical College, Omaha, 1899; member of the Utah State Medical Association; formerly on the staff of the Holy Cross Hospital; aged 65; died, July 13, of coronary occlusion.

Cornelius J. Lynch ✠ Yakima, Wash.; Kentucky School of Medicine, Louisville, 1900; fellow of the American College of Surgeons; past president of the Washington State Medical Association; aged 66; died, July 18, in St. Elizabeth's Hospital.

Ernest Christian Day, Chicago; Rush Medical College, Chicago, 1936; member of the Illinois State Medical Society; captain, 108th medical regiment, Illinois National Guard, Camp Forrest, Tenn.; aged 37; was killed, July 20, in an automobile accident.

William Jefferson Prish, Fredonia, N. Y.; Hahnemann Medical College and Hospital of Philadelphia, 1885; member of the Medical Society of the State of New York; for many years health officer; aged 80; died, July 17, of coronary occlusion.

Mary P. H. Hough, Ambler, Pa.; Woman's Medical College of Pennsylvania, Philadelphia, 1881; aged 83; died, July 25, in the Hospital of the Woman's Medical College of Pennsylvania, Philadelphia, of cerebral hemorrhage and embolism.

Atchilous Bramwell Moore, Greenville, Texas; Vanderbilt University School of Medicine, Nashville, Tenn., 1878; University of Nashville Medical Department, 1880; member of the State Medical Association of Texas; aged 87; died in July.

Eugene Lester Baker, Oak Park, Ill.; University of Illinois College of Medicine, Chicago, 1925; major, 108th medical regiment, Illinois National Guard, Camp Forrest, Tenn.; aged 42; was killed, July 20, in an automobile accident.

George Reginald Smith, Port Huron, Mich.; Detroit College of Medicine, 1903; member of the Michigan State Medical Society; past president of St. Clair County Medical Society; aged 60; died, July 21, in the Harper Hospital, Detroit.

Guy Stone, Fargo, N. D.; National Medical University, Chicago, 1905; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1910; aged 64; died, June 22, in Minneapolis of coronary sclerosis.

William W. Morrison, Edgerton, Wis.; Northwestern University Medical School, Chicago, 1897; member of the State Medical Society of Wisconsin; for many years health officer; aged 72; died, July 12, of chronic myocarditis.

Jessie Stevens Edwards, Southampton, N. Y.; Woman's Medical College of the New York Infirmary for Women and Children, 1897; aged 77; died, July 17, in the Southampton Hospital of chronic myocarditis and chronic nephritis.

John Kent Johnston ✠ Tallahassee, Fla.; University of Maryland School of Medicine, Baltimore, 1912; served during the World War; surgeon in chief of the Johnston Sanitarium; aged 53; died, July 15, in Jacksonville of heart disease.

J. L. Webster Peck, Frankton, Ind.; Physio-Medical College of Indiana, Indianapolis, 1895; member of the Indiana State Medical Association; aged 71; died, July 7, of cerebral thrombosis, chronic myocarditis and arteriosclerosis.

Roy Henry Garm, Beardstown, Ill.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1901; served during the World War; aged 62; died, July 23, in the Norbury Sanatorium, Jacksonville, of cerebral hemorrhage.

Philip Griesbaum, Lebanon, Ill.; Washington University School of Medicine, St. Louis, 1910; member of the Illinois State Medical Society; president of the high school board of education; aged 57; died, July 29, in Jacksonville.

Eustace Cosmo Mason ✠ Quebeck, Tenn.; University of Nashville (Tenn.) Medical Department, 1908; served during the World War; aged 72; died, July 15, in St. Thomas Hospital, Nashville, following an operation for appendicitis.

William Lee Jennings, Indianapolis; University of the City of New York Medical Department, 1888; member of the Indiana State Medical Association; aged 78; died, July 26, in the Methodist Hospital of carcinoma of the pancreas.

William Elbert Faris, Birmingham, Ala.; University of Tennessee Medical Department, Nashville, Tenn., 1916; served during the World War; aged 53; died, July 24, of bilateral pulmonary tuberculosis and pyelonephritis.

William Bernard Kinlaw ✠ Rocky Mount, N. C.; University of Pennsylvania School of Medicine, Philadelphia, 1920; fellow of the American College of Physicians; aged 45; was killed, July 24, in an automobile accident.

James William Gustin, Bay City, Mich.; Detroit College of Medicine, 1903; member of the Michigan State Medical Society; aged 64; died, July 21, in the Billings Memorial Hospital, Chicago, of heart disease.

Simon Seitz Mann, Columbia, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1894; member of the Medical Society of the State of Pennsylvania; aged 73; died, July 14, of coronary thrombosis.

James Eggleston Morrison, Fayetteville, N. C.; Atlanta (Ga.) School of Medicine, 1908; served during the World War; on the staff of the Veterans Administration Facility; aged 59; died, July 15, of heart disease.

Alphonse J. Gerend, Sheboygan, Wis.; Wisconsin College of Physicians and Surgeons, Milwaukee, 1903; served during the World War; aged 61; died, July 17, in the Veterans Administration Facility, Wood.

Edgar A. Pole, Hot Springs, Va.; Baltimore Medical College, 1897; member of the Medical Society of Virginia; aged 71; died, July 19, in the Martha Jefferson Hospital and Sanitarium, Charlottesville.

Bernard Bruce Newbarr, Los Angeles; Baltimore Medical College, 1911; at one time assistant professor of surgery at the Woman's Medical College of Pennsylvania, Philadelphia; aged 55; died, July 4.

William Bernhart Hamaker ✠ Lancaster, Pa.; Baltimore Medical College, 1905; on the staff of St. Joseph's Hospital; aged 63; died, July 15, in the Lancaster General Hospital of cerebral hemorrhage.

William Warren Sturgis, Valencia, Pa.; Jefferson Medical College of Philadelphia, 1887; member of the Medical Society of the State of Pennsylvania; aged 89; died, June 5, in Mars of chronic myocarditis.

Nicholas Frederick Feury, Orlando, Fla.; Vanderbilt University School of Medicine, Nashville, Tenn., 1898; served during the World War; aged 66; died, July 6, of myocarditis and arteriosclerosis.

Jacob Alexander Garrard, Bartow, Fla.; Southern Medical College, Atlanta, 1897; for many years president of the city council; formerly chairman of the county school board; aged 76; died, July 15.

Sidney Harris, Herbine, Ark.; Kentucky School of Medicine, Louisville, 1892; member of the Arkansas Medical Society; served during the World War; aged 74; died, July 28, of cerebral hemorrhage.

Jacob Compton Shinn, Bridgeton, N. J.; Hahnemann Medical College and Hospital of Philadelphia, 1899; aged 78; died, July 24, in the Ivy Hall Hospital of carcinoma of the pancreas and myocarditis.

Timothy Daniel Sullivan ✠ New York; Jefferson Medical College of Philadelphia, 1905; aged 67; on the staff of the Manhattan Eye, Ear and Throat Hospital, where he died, July 6, of heart disease.

William Franklin Pitt, Hayti, Mo.; St. Louis College of Physicians and Surgeons, 1923; member of the Missouri State Medical Association; aged 49; was killed, July 20, in an automobile accident.

William Samuel Fleming, Denver; John A. Creighton Medical College, Omaha, 1903; served during the World War; aged 68; died, July 18, of heart disease, arteriosclerosis and diabetes mellitus.

Mary Joan O'Leary, Milwaukee; Marquette University School of Medicine, Milwaukee, 1934; member of the State Medical Society of Wisconsin; aged 33; died, July 9, in East Troy, Wis.

James Alfred Copeland, Wickenburg, Ariz.; Fort Worth School of Medicine, Medical Department of Fort Worth University, 1902; aged 70; died, July 22, of carcinoma of the pancreas.

Amos Arthur Barton ✠ Plains, Pa.; Kentucky School of Medicine, Louisville, 1876; an Affiliate Fellow of the American Medical Association; aged 92; died, July 29, of chronic myocarditis.

George Denis Mulligan, Norristown, Pa.; Temple University School of Medicine, Philadelphia, 1927; formerly police surgeon; aged 43; died, July 27, in Philadelphia.

Bureau of Investigation

STIPULATIONS

Agreements Between Federal Trade Commission and Promoters of Various Products

The following items are abstracts of stipulations in which promoters of "patent medicines," cosmetics or medical devices have agreed with the Federal Trade Commission to discontinue certain misrepresentations in their advertising. These stipulations differ from the "Cease and Desist Orders" of the Commission in that such orders definitely direct the discontinuance of misrepresentations. The abstracts that follow are presented primarily to illustrate the effects of the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act on the promotion of such products.

Advance Spectacle Company Eyeglasses.—One Michael M. Egel does business in Chicago as the Advance Spectacle Company. In October 1940 he promised the Federal Trade Commission to desist from certain misrepresentations in the sale of eyeglasses, such as that his glasses will enable one to read, sew or see better in every way, or that the method used in testing the eyes and in purchasing his glasses is the same as used by any one else.

Albaderm.—In January 1940 the Federal Trade Commission reported that one Harry Tomback, trading as the Tomil Research Laboratories, New York, had promised to cease advertising that application of his Albaderm will of itself relieve acne or other skin blemishes; that persons with skin blemishes can obtain permanent relief therefrom, that Albaderm will remove bacterial infections causing skin blemishes and that it is harmless in all cases.

Barnard Grater.—William G. Barnard and William G. Barnard Jr., trading as Natural Foods Institute, Cleveland, put out this food grater and a health booklet. In January 1940 they signed a stipulation with the Federal Trade Commission promising to cease and desist from representing that carrots or carrot juice is a remedy or competent treatment for any disease or disorder of the human body; that carrots contain more vitamins A, B, C and G than any other vegetable; that carrot juice has healing properties or unusual health value or helps counteract body toxins; that the book, "Health Via The Carrot," outlines proper juice diets that will help correct any disease.

Black Drops.—In June 1940 Mrs. L. H. Tillotson, Painesville, Ohio, promised the Federal Trade Commission that she would no longer advertise this product as being a "specific" for neuritis of the sciatic nerve, for kidney trouble or for any other disease, and as being a cure for any sickness or disease. She also agreed to cease representing that the product contains no drugs and is sold by a doctor of medicine.

Cento Tea.—This product, formerly known as "Aesculapius Tea," is put out by one Otto Wise, trading as the Medical Tea Company of California, Inc., Los Angeles. In June 1940 Wise promised the Federal Trade Commission that he would cease representing that the preparation or any of its ingredients is valuable in treating gall, liver or kidney ailments or in preventing or dissolving kidney stones or gallstones; that the product is a competent and reliable agent for relief of symptoms associated with gall, liver or kidney ailments, or possesses healing or analgesic properties, and other similar representations; that it is not a laxative; that its ingredients are carried to the affected parts; that its every ingredient possesses therapeutic values and that its hypericum content stimulates the appetite. In the following month (July 1940) V. R. Smith, trading as Smith and Bull Advertising Agency, Los Angeles, likewise promised the Federal Trade Commission to discontinue the foregoing claims in advertisements of "Cento Tea."

Chief Two Moon Products.—Under this brand name the Chief Two Moon Herb Company, Inc., Waterbury, Conn., puts out a miscellany of nostrums, including a "Bitter Oil," a "Cough Elixir," a "Skin Cream," a "Stomach Relief," a "Kidney Relief," a "Nerve Remedy," a "Female Tonic," a "Rheumatism Relief," a "Tonic Relief," an "Eczema Relief" and a "Liver Relief." All but the first three of these are also designated by the term "All-Herb." In May 1940 the concern promised the Federal Trade Commission to cease representing that the products have brought relief and restored health and happiness to thousands of sufferers, or that they are effective treatments for stomach trouble, tumors, rheumatism, kidney and liver ailments, nervousness and asthma.

Digests.—This was advertised to overcome bad breath, promote improved digestion and to give "new relief." In April 1940 Wolverine Products, Inc., Detroit, stipulated with the Federal Trade Commission that it would discontinue these misrepresentations and would cease designating its preparation as "Digests" or using any other name implying that it is a digestive or has any direct effect on digestion.

Dixie Dale De Luxe Hair Preparation.—In June 1940 Michael Michalik, trading as Dixie Dale Company, Chicago, promised the Federal Trade Commission that he would cease representing that "Dixie Dale De Luxe Hair Preparation" will grow hair or speed its growth, stop hair from falling out, give to hair strength or life, make hair softer and end dandruff troubles.

Egyptian Herb Tea.—This is put out by one Ralph E. Pritchard, trading as Egyptian Herb Tea Company, Akron, Ohio. In September 1940 he signed a stipulation with the Federal Trade Commission promising to cease representing that his product is a competent treatment or effective remedy for obesity, is efficacious in the treatment of rheumatism, kidney trouble, high blood pressure, indigestion, gas on the stomach, pyelitis, backache or any other disorder aside from constipation.

Electro-Health Activator.—This device, also known as "The New Improved Activator," is put out by Unico Products, Inc., Detroit. For a time the concern represented that it constructed or manufactured the device, that the thing was new in principle, had been approved by the medical profession, would benefit every one over 40, would have a rejuvenating or general tonic effect or would for the first time enable persons to use electrotherapy at home. In September 1940 the concern stipulated with the Federal Trade Commission that it would discontinue these misrepresentations and some others, such as that the device has any physical therapeutic value (except as a possible aid in the temporary relief of chronic nerve pain when there is no acute inflammation present along the nerve, and as an adjunctive treatment in cases in which its actual cutaneous stimulative properties are known to be helpful).

Fenton Compound.—Having represented this product as a new type of medicine which constituted a medical discovery, and as an effective treatment for lumbago, liver and kidney troubles, which would also increase the flow of bile from the liver and assist in removing poisons and impurities from the entire system, Will T. Warren Jr., trading as Fentone Medicine Company, Paris, Tenn., promised the Federal Trade Commission in October 1940 to discontinue these representations.

Glamour Permanent Wave Outfit.—In June 1940 the Federal Trade Commission accepted a stipulation from Sally Lindner, Sybil Moses and Jean Tanner, trading as Mollin Company, St. Paul, in which they agreed to discontinue certain misrepresentations in the sale of permanent wave outfits for home use. Among these were that by the use of their materials a permanent wave may be accomplished which will last for six months in every instance, regardless of the type or kind of hair treated; that it "reconditions the hair," or any similar statement, so as to convey the belief to purchasers that the outfit will restore old, worn or faded hair to its original condition.

Grecian Chemical Company Products.—A Philadelphia concern, the Grecian Chemical Company, trading as Zala Perfumery Company and The Olivo Company, promised the Federal Trade Commission in August 1940 to cease using the words "scalp food" or "Feed the scalp what it needs" so as to imply that its products act as nutriment for the scalp. Another government agency, the Food and Drug Administration, previously (July 1937) had reported that two preparations put out by the Zala Perfumery Company, Philadelphia, had been found to violate the Pure Food and Drugs Act because of fraudulent representations on their labels. These were "Olivo Hair Tonic," sold as a remedy for dandruff, eczema and falling hair, and "Olivo Hair Oil," put out for the same conditions. The "Hair Tonic" was reported by government chemists to consist of 71 per cent of denatured alcohol, about 19 per cent of castor oil and small amounts of glycerin, resorcinol, perfume and coloring, and the "Hair Oil" to be essentially petrolatum with about 2 per cent of a fatty oil and a small amount of resorcinol. This case was described under Notice of Judgment *26772*, issued in July 1937 and briefly abstracted in THE JOURNAL, Sept. 24, 1938, page 1229.

Health Spot Shoes.—The Musebeck Shoe Company, Danville, Ill., promised the Federal Trade Commission in August 1940 that it would cease representing that these shoes will relieve the wearer of foot trouble or enable him to get rid of foot disorders, including sick, sore, tired or aching feet; that the shoes represent perfect foot health and comfort insurance and will keep the feet healthy or control the bones of the feet. The company also promised to cease representing that these shoes keep the whole body in good posture and are fitted by persons who have taken a course in scientific shoe fitting.

Ives Wonder Pile Remedy.—This is put out by C. G. Ives, Minneapolis, trading as Ives Drug Company, Glenwood Drug Company and Ives Druggist, who in May 1940 promised the Federal Trade Commission to cease representing that his nostrum is an effective remedy or competent treatment for hemorrhoids; that its use will render an operation unnecessary or that it had any therapeutic value in the treatment of hemorrhoids in excess of a mild, temporary palliative for the itching, burning and similar irritations that are usually due to, or associated with, the superficial symptoms of some types of hemorrhoids. Ives further agreed to cease employing the word "Remedy" or any term of like import as part of a trade name used to describe the preparation.

Jones Pulmotor Arch Support.—In March 1940 the Jones Pulmotor Arch Support Company, Kansas City, Mo., stipulated with the Federal Trade Commission that it would desist from advertising that its device would strengthen the feet or the foot muscles, rebuild the feet, correct or cure any foot disorder or any condition which causes foot or leg ailments, stimulate circulation of the blood or aid in the elimination of poisons and increase energy or vitality. The concern also agreed to cease representing that its arch supports are complete "air cushions" or that they cause any massaging effect or vacuum suction action which is of therapeutic, remedial or palliative value or effect or which aids in the elimination of fatigue or is beneficial to any part of the system.

Juliette Marglen Cosmetics.—These are put out by Juliette Marglen Products Company, Hollywood, Calif. In April 1940 this concern signed a stipulation with the Federal Trade Commission agreeing to discontinue misrepresentations in its advertising. Among these were statements or representations tending to convey the belief that these products contain wax in such amount as to form a continuous wax coating such as would

afford protection to the nails to which applied; or of any representations that the products will afford any appreciable aid in keeping the cuticle soft and pliable, or that their use will encourage the growth of stronger or thicker nails or have a stimulating effect on the nails, or prevent cracking, breaking or splitting of the nails of the user.

Kamazin Powder.—Israel Freed, trading as Kamazin Manufacturing Company, New York, signed a stipulation with the Federal Trade Commission in March 1940 in which he agreed to cease representing that the use of this product affords relief from the condition known as athlete's foot for a long period of time or affords permanent relief, and that doctors prescribe or endorse Kamazin Powder.

Kano.—This product, formerly known as "Pecano," is put out by one Elam G. Hess, Manheim, Pa. In April 1940 Hess, in a stipulation with the Federal Trade Commission, agreed to cease representing that Kano is the best source of tissue building material and revitalizes or recleanses one's body and that it is effective in treating malnutrition in all cases or in cases which may be due to causes other than a deficiency of the food elements supplied by this product. Hess also promised to cease making certain other misrepresentations for Kano, particularly as a food product, such as that it supplies more nourishing value than does beefsteak, eggs, whole milk or fish.

Lesko Herbs Tea.—In May 1940 Mrs. Greta J. Leskovar, New York, who puts out this nostrum, agreed in a stipulation with the Federal Trade Commission to cease representing that this product is a competent treatment or effective remedy for retarded, suppressed, irregular monthly periods, is an aid for the relief of the pain or discomfort attending irregular menstruation or will relieve the cramps or colic of troublesome or irregular menstruation due to exposure or cold or any other cause.

Lucone Herb Tonic.—Lucone, Inc., New York, puts out this nostrum and in October 1940 it promised the Federal Trade Commission that it would cease using the word "Herb" as part of the trade name and from representing the thing as a herb tonic containing no greasy substances and capable of promoting or assuring a robust or abundant growth of hair; as preventing baldness or dandruff, saving the hair or stopping hair loss and keeping the hair roots active. The concern also agreed to cease advertising that its product is of aid in correcting unhealthy conditions of the scalp, keeps the hair free of infection or preserves the scalp. In December 1940 Newmark's Advertising Agency, Inc., New York, which handled the Lucone advertising, also stipulated with the Federal Trade Commission that it would discontinue these objectionable representations.

Mayhugh's Oil Solution and Nasal Inhaler.—These products were advertised for the treatment of hay fever, asthma and colds by Harry D. Mayhugh, trading as Nasal Inhaler Company, Walton, Ky. In October 1940 he stipulated with the Federal Trade Commission that he would cease representing that his medicine and the inhaler constituted a competent treatment or effective remedy for hay fever, rose fever, asthma, colds and other inhalant ailments; afforded freedom from congestions in the head; assured daytime relief or restful slumber at night, and rest for children as well as adults; that physicians recognized in "Mayhugh's Nasal Inhaler" a device for properly treating inhalant ailments; that the inhaler filtered the pollens of flowering plants from the air, purified the air entering the nostrils or removed the cause of hay fever and asthma due to pollen or dust and that it filtered the germs from the air inhaled, relieving congestion of the nostrils during a cold.

Mystic Cream.—Mystic Laboratories, Inc., Jersey City, N. J., promised the Federal Trade Commission in April 1940 to cease representing that this product is an amazing or scientific development or that, when rubbed on the hands, it will make them as soft or as white as the hands of a child; that it will cause any immediate transformation in the condition of the skin or has any other than a temporary effect on the skin unless used regularly or unless such representations are limited to rough, red or chapped hands.

Native Herb Medicine.—In October 1940 one Oman E. Johnston, trading as Kenjol Pharmacal Company, Fremont, Ohio, promised the Federal Trade Commission that he would discontinue certain misrepresentations in the sale of his "Native Herb Medicine." Among these were that the product will relieve or cure ailments such as biliousness or colds or rid the system of lumbago or rheumatism; that it is a competent remedy for functional diseases such as hardening of the arteries, diseased kidneys and other ailments; that it possesses any direct remedial value, or that it has medicinal properties other than that of a laxative.

Nu-Nile Double-Strength Tar Hair Grower.—This is put out by the Peerless Products Company, Jersey City, N. J. For a time it was represented to aid in the growth of hair, contribute nourishment to the scalp, stop the falling of hair, remedy eczema of the scalp or any other kind of eczema or be an effective treatment for dandruff. In September 1940 the company promised to discontinue such representations and also that "Nu-Nile Pressing Oil Glossine and Special Hair Grower" has any special value as a hair grower, that it will keep the hair soft, smooth or glossy or do more than impart an oily substance to the surface of the hair shafts, which temporarily makes them feel soft and appear smooth and glossy. Further, the company agreed to cease using the word "Grower" or any simulation or abbreviation of it to describe either of its preparations.

Owl Stimulators.—This product, also known as "Owl Stimulars," was advertised by W. J. O'Neil, trading under the names Owl Stimulators Co., O. S. T. Co. and Owl Stimular Tablet Co., Boston, as being capable of stimulating "pep," vigor and vitality or as having tonic, nutritive or stimulating properties. In September 1940 O'Neil stipulated with the Federal Trade Commission that he would discontinue these claims and certain other representations.

Palm Beach Hair Grower and Palm Beach Pressing Oil.—These are put out by a Mrs. C. T. Hall of Chicago, who in October 1940 stipulated with the Federal Trade Commission that she would discontinue certain misrepresentations in the sale of the products. Among these were that by the use of them the scalp is made healthy; that the hair regains its vitality or that new life appears or can be seen in the strands of the hair; that "Palm Beach Hair Grower" is beneficial to the roots of the hair, is a competent treatment or effective remedy for diseased or itchy scalp, or for dandruff, or that it heals such conditions. Mrs. Hall further agreed to cease using the word "grower," or any words of similar import or any letters, word or syllable that simulate "grower" in sound or spelling, on the label of the containers, or as a part of the trade name of any of the products.

Peacock's Garlic Capsules.—In May 1940 New England Products, Inc., Evanston, Ill., promised the Federal Trade Commission to cease representing that this preparation is rich in calcium, potassium or phosphorus or provides alkaline properties for the human system; that it is of value in the treatment of colon irritation or indigestion, except through any value it may have as a carminative, or in treating high or low blood pressure, except for certain temporary benefits; that it is of value in treating rheumatism, bronchitis or other respiratory infections or is antiseptic or has germ-killing powers when taken internally.

Rilling Koolerwave and Rilling Concentrator.—The first of these is a hair waving device of the machineless type and the second, a hair dryer. They are put out by Rilling-Arnao Company, Minneapolis. In October 1940 the Federal Trade Commission reported that this concern had signed a stipulation to cease advertising that a permanent wave given with Rilling Koolerwave equipment starts at the scalp or is one-half inch closer, or closer by any definite measurement, than any other method; that all methods of permanent waving other than the Rilling Koolerwave injure the hair.

Safe-Clean Laxative.—This is put out by Roy Quinlan, trading as Sunclean Products Company, New York, who in June 1940 stipulated with the Federal Trade Commission that he would discontinue certain misrepresentations in his advertising. Among these were that the product is a "wonderful discovery" producing "amazing results," or that its results are different from those of competing laxatives; that it will end constipation, contains nothing injurious and is not habit forming; that its use will keep the intestine clean and healthy and that it has any appreciable effect on the functioning of the liver or kidneys. Quinlan admitted, among other things, that a laxative is contraindicated under certain conditions, in which cases this preparation would not be safe for use.

Spencer's Cold Ointment.—This was involved in a stipulation signed in September 1940 by Brown Drug Company, Sioux Falls, S. D. In this the concern promised the Federal Trade Commission to desist from advertising its preparation as having a wool fat base, as containing double strength or extra strength medication, and as being capable of penetrating the skin. Further, the company agreed to cease representing that its ointment is a competent remedy or an effective treatment for colds, and that cold ointments made with a mineral jelly base stay on the surface of the skin because of the presence of the mineral jelly.

To-He-To Ointment.—In April 1940 John W. Oneal, trading as J. W. Oneal Chemical Company, Martins Ferry, Ohio, promised the Federal Trade Commission to discontinue certain misrepresentations in the sale of this ointment. Among these were that it is a competent or effective remedy for colds, headaches, sore throat, croup, pneumonia, chafed hands, itching hemorrhoids, sore muscles, chilblains, bruises, rheumatism or hay fever or that it will do more than serve as a palliative in connection with certain of these conditions.

Uriel Buchanan's Regenerating System.—This consisted of literature sent out under the name of Uriel Buchanan, who distributed booklets and mimeographed sheets entitled "Keeping Young" and "Health and Rejuvenation." In September 1940 Buchanan stipulated with the Federal Trade Commission that he would cease advertising that his literature contains instructions pertaining to health, food and diet which, when observed and applied, will enable one to regain youth or youthful vitality, ward off old age, prolong life, acquire or keep a youthful body, reactivate or rejuvenate glands, and similar representations, and that he would discontinue representing that his literature discloses any secrets, discoveries or newly discovered principles.

Walter C. Rathke Cosmetics.—Rathke conducted a cosmetic business in St. Paul, using the name W. C. Rathke Laboratories. It appears that he had some connection with a Minneapolis outfit known as Continental News, Inc., which published a magazine called *True Mystic Science* and sold cosmetics under the trade name "Mystic Glow," as Rathke also apparently did. In September 1940 the Federal Trade Commission accepted from these concerns stipulations in which they promised to discontinue certain objectionable practices and representations. Among these were designating a complexion cream as a "tissue cream" or a "skin normalizer" or as one that "penetrates deep" into the skin or promotes skin health, or otherwise has any beneficial effect on the tissues of the skin cell structures; representing that a cleansing cream "revitalizes" the skin; that the cactus plant has any recognized curative or mystic healing properties or that an "oil" extracted from cactus has been known since ancient civilization to possess any unusual healing qualities; that such cactus product or any other ingredient in these concerns' preparations lubricates withered skin to suppleness, stimulates fatigued glands into releasing the precious drop of moisture confined at the bottom of each pore or penetrates into sluggish or atrophied glands or nourishes them into activity.

Correspondence

COMPARATIVE FOOD SOURCES OF THIAMINE

To the Editor:—One of the points stressed by the keynote speakers of the recent National Nutrition Conference for Defense called by the President of the United States was the importance of a better knowledge regarding foods. At this conference the daily individual allowances of specific nutrients recommended were announced. This information was given in terms of calories, grams, milligrams and vitamin units, not of foods but of nutrient elements such as proteins, mineral elements and vitamins. Such information is obviously intended for those whose role it is to interpret them to the public in terms of foods.

Milligrams of Thiamine and of Riboflavin per Thousand Calories

Vegetable	Thiamine	Riboflavin
Asparagus	6.7	4.9
Beans, lima	2.6	...
Beans, snap	1.7	2.2
Beans, wax	2.1	2.4
Beets	1.1	0.5
Broccoli	2.7	5.9
Brussels sprouts	3.0	...
Cabbage	2.8	1.9
Carrots	1.6	1.5
Cauliflower	5.4	4.1
Celery	1.7	1.6
Corn	1.1 *	1.1 †
Corn	1.4 ‡	0.7 §
Endive	4.1	2.5
Kale	3.8	...
Lettuce	...	5.3 #
Lettuce	4.8 ¶	2.6 ‖
Mustard greens	5.0	...
Okra	3.3	...
Onions	0.63	2.5
Peas	3.9	1.4
Potatoes	2.2 **	...
Potatoes	1.7 ††	0.59
Spinach	4.2	6.4
Squash, winter	1.1	1.0
Squash, summer	2.2	2.7
Sweet potatoes	0.74	0.55
Tomatoes	3.4	2.3
Turnip greens	3.8	...
Turnips	1.7	1.2
Average	2.8	2.4
Added to enriched flour	1.6	0.72

* White. § Mature. ‖ Head.
† Roasting ears. # Leaf. ** New.
‡ Yellow. ¶ Head. †† Old.

The lay consumer cannot be expected to think or reckon in terms of proteins, calories, milligrams of minerals or vitamin units.

Even before the vitamins were recognized it was urged that we consume more liberal amounts of dairy products, vegetables and fruits. When the vitamins were discovered, dairy products, vegetables and fruits were designated as the "protective foods." The following statement is quoted from Dr. Russell M. Wilder in *Science News Letter* in April 1941: "Thiamine is found generously in rather few foods, such as whole grain cereals, lean meats, peas and beans. . . . Most foods contain some thiamine, but many foods, like the garden vegetables, formerly thought to be excellent protective foods, are poor in thiamine."

If nutritional information is now to be based on terms of nutrient elements rather than on terms of food or food types, it is essential to examine foods with reference to these nutrient elements. This is particularly true in connection with vegetables, in view of the implication that they no longer should be regarded in the category of protective foods. A report of a biologic determination of the thiamine in some eighty foods is given in Technical Bulletin 707 of the United States Bureau of Home Economics. A. Z. Hodson of Cornell University recently reported in *Food Research* the riboflavin as determined chemically in a number of vegetables. Thiamine and riboflavin —the former in the amount of 1.66 mg., the latter in the amount of 1.2 mg. a pound—are both required in so-called enriched flour as recommended by Dr. Wilder's committee. The per person daily allowance of these vitamins as recommended by the committee is proportioned to the calory intake. This is done because, as the committee states, "they are part of the enzyme system involved in the metabolism of carbohydrates."

It seems logical therefore to consider the thiamine and riboflavin content of a food in terms of its calory content. There is another reason for this. A person's calory intake is a fairly fixed value as long as his living conditions undergo no material change; his appetite sees to that. If he undertakes to increase his vitamin or mineral intake through dietary procedure, this he can accomplish only by displacing certain food items low in these nutrient elements by an equal calory value of other foods containing them in higher amounts proportional to their calory values.

In the accompanying table are given the thiamine and riboflavin content as far as available from the two most recent reports cited, calculated in terms of their caloric content. The calory values of the vegetables was taken from circular 146, United States Department of Agriculture. The figures represent milligrams of vitamin per thousand calories of vegetable. In this proportion they are nearest simple whole numbers.

The amounts added to enriched flour are appended to this table for comparison. The amounts originally found in white flour are so small as to be of little consequence. A pound of flour represents 1,660 calories, and hence 1.66 mg. of thiamine and 1.2 mg. of riboflavin per pound represent respectively 1 and 0.72 mg. per thousand calories. It will be noticed that only onions and sweet potatoes are as low in thiamine as this, and only beets, sweet potatoes and mature roasting ears are as low in riboflavin. The average for all the vegetables is two and eight-tenths times the added thiamine in "enriched" flour and three and three-tenths times the added riboflavin.

In addition to the high content of these vitamins in vegetables, the other members of the B vitamin complex are, as far as evidence is available, present in similar proportions while absent in flour, or nearly so. This is equally true of other vitamins and of mineral elements. Colored vegetables, green and yellow, are recognized as among the richest source of vitamin A, and many vegetables are rich in vitamin C even if allowance is made for losses in cooking. While only green leaf vegetables are outstandingly high in calcium, in general vegetables are the best assurance of an adequate and balanced mineral supply in conjunction with the usually recommended intake of milk for calcium and phosphorus. Since vegetables are now shipped for long distances to nearly every locality, any mineral deficiency in soil and hence in the produce in one area is corrected by that from another area.

In the past, flour consumption went down as vegetable consumption rose. If "enriching" flour results in increased flour consumption, an equivalent calory value of other foods will be withdrawn from consumption, and it is likely that these other foods will be to a considerable extent vegetables. If the flour

consumption remains unchanged the diet will be enriched to the extent of the vitamins and minerals added to the flour. If an increase in flour consumption displaces vegetables, it follows inevitably that the nutritional quality of the diet will suffer. Vegetables supply more of the "at least forty different food substances" referred to by Surgeon General Parran of the United States Public Health Service, at the Nutritional Conference, than any other food but milk, and in an excellently balanced proportion.

On a weight basis the 1.66 and 1.2 mg. respectively of thiamine and riboflavin to be added to flour may seem high. But flour is never eaten as flour. This is ably expressed by Elizabeth Aughey and Esther Peterson Daniel of the United States Bureau of Home Economics in the *Journal of Nutrition:* "The whole grain cereals and dried legumes included in every list of thiamine-rich foods furnish less of this vitamin than is generally supposed. In the past these lists have been made up on the basis of raw foods and the large proportion of water absorbed during preparation leaves an average serving of the cooked product with a relatively lower thiamine value than is ordinarily realized. On a serving basis, baked potatoes, including skin, rank higher in thiamine than cooked whole wheat or oat cereals. Even boiled potatoes, spinach and carrots may be classed as furnishing amounts of thiamine per serving comparable to those supplied by these cooked cereals. One slice of an all-whole wheat bread also contains approximately the same quantity of thiamine as one serving of these vegetables and cereal foods."

This quotation leads to the conclusion that on a serving basis the vegetables singled out—about average representatives of all vegetables—are on a par with whole grain cereals in supplying thiamine, i. e. vitamin B_1. From the data in the table it is evident that they surpass the cereals about threefold on a calory basis. There seems ample justification that vegetables should continue to be rated among the so-called protective foods and that their increased consumption is one of the most effective means to attain the end striven for in modern nutrition.

E. F. KOHMAN, PH.D.,
Products Research Division,
Campbell Soup Company,
Camden, N. J.

NOTE.—As Dr. Kohman so ably points out, vegetables are important protective foods. As a class vegetables are not particularly rich sources of either thiamine or riboflavin. It does not seem practicable to try to make up for the loss of thiamine from the human dietary which results from the substitution of highly refined cereal foods for whole grain products by eating more vegetables. Six slices of whole wheat bread will supply about 0.5 mg. of thiamine, which is about as much as can be supplied by 4 ounces of potatoes plus 4 ounces of tomatoes plus 4 ounces of other vegetables. The values in the table provided by Dr. Kohman are impressive; they are, however, in terms of quantities of vegetables which will provide 1,000 calories. It takes about two hundred stalks of asparagus or 12 pounds of lettuce to get 1,000 calories. The Council on Foods and Nutrition has called attention to the importance of considering foods on the basis of the amount that can easily be eaten in a day. On this basis, potatoes rate as a good source of iron and of thiamine and an excellent source of ascorbic acid. Tomatoes are rated as excellent sources of vitamin A and ascorbic acid and as good sources of thiamine and riboflavin. Vegetables and enriched cereals are both good foods, but the important thing is to eat a well rounded, adequate diet.—ED.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

Chicago, Feb. 16-17, 1942. Council on Medical Education and Hospitals, Sec., Dr. William D. Cutter, 535 N. Dearborn Street, Chicago.

BOARDS OF MEDICAL EXAMINERS
BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL, August 30, page 809.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Parts I and II. Various centers, Sept. 15-17. Part III. Baltimore and New York City, October; Boston, November. Exec. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Written.* Nov. 3. Final date for filing application is Sept. 23. *Oral.* Dec. 12-13. Final date for filing application is Nov. 8. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF INTERNAL MEDICINE: *Oral.* April, in advance of the meeting of the American College of Physicians and June, in advance of the meeting of the American Medical Association. Final date for filing application is Oct. 20. Sec., Dr. William S. Middleton, 1301 University Ave., Madison, Wis.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Written. Part I. Group B.* Various centers, Jan. 3. Final date for filing application is Oct. 6. *Oral. Part II. Groups A and B.* Atlantic City, May or June. Final date for filing application is March 1. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF OPHTHALMOLOGY: *Oral.* Chicago, Oct. 18. *Written.* March 7. Sec., Dr. John Green, 6830 Waterman Ave., St. Louis.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: Washington, January. Final date for filing application is Nov. 1. Sec., Dr. Guy A. Caldwell, 3503 Prytania St., New Orleans, La.

AMERICAN BOARD OF PEDIATRICS: *Oral.* Philadelphia, March or April, at the time of the Region I meeting of the American Academy of Pediatrics. Cleveland, May, at the time of the Region III meeting of the American Academy of Pediatrics. Los Angeles, May, at the time of the Region IV meeting of the American Academy of Pediatrics. *Written.* Locally, approximately 6 weeks in advance of the date of oral examination. Sec., Dr. C. A. Aldrich, 707 Fullerton Ave., Chicago.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: *Oral.* New York, Dec. 19-20. Final date for filing application is Oct. 5. Sec., Dr. Walter Freeman, 1028 Connecticut Ave., N.W., Washington, D. C.

AMERICAN BOARD OF SURGERY: *Written. Part I.* Various centers, Oct. 6. *Oral. Part II.* New York Nov. 10-11. A meeting of the board will follow on the 12th. Sec., Dr. J. Stewart Rodman, 225 S. Fifteenth St., Philadelphia.

AMERICAN BOARD OF UROLOGY: *Written.* Various centers, December. *Oral.* Chicago, February. Final date for filing application is Nov. 1. Sec., Dr. Gilbert J. Thomas, 1009 Nicollet Ave., Minneapolis.

Kentucky June Report

The State Board of Health of Kentucky reports the written examination for medical licensure held at Louisville, June 5-7, 1941. The examination covered eleven subjects and included 110 questions. An average of 70 per cent was required to pass. Seventy-nine candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Rush Medical College	(1940) 80,	(1941)	82
University of Louisville School of Medicine	(1940) 80, (1941) 76, 77, 77, 77, 77, 78, 78, 78, 78, 79, 79, 79, 80, 80, 80, 80, 80, 80, 80, 80, 80, 80, 80, 80, 80, 80, 80, 80, 81, 81, 81, 81, 81, 81, 81, 81, 81, 81, 81, 81, 81, 82, 82, 82, 82, 82, 82, 82, 82, 82, 82, 82, 82, 82, 82, 82, 83, 83, 83, 83, 83, 83, 83, 84, 84, 84, 84, 85, 85, 86, 86		
University of Maryland School of Medicine and College of Physicians and Surgeons	(1941)		82
Creighton University School of Medicine	(1940)		78, 79
Meharry Medical College	(1941)		81

Seventeen physicians were licensed to practice medicine by reciprocity and 2 physicians so licensed by endorsement from January 15 through May 19. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Arkansas School of Medicine	(1924)		Arkansas
Northwestern University Medical School	(1935)		Missouri
Rush Medical College	(1933) Pennsylvania,	(1939)	Missouri
Tufts College Medical School	(1915) New York,	(1934)	Florida
Eclectic Medical College, Cincinnati	(1929)		Ohio
University of Cincinnati College of Medicine	(1934, 2), (1936), (1939), (1940)*		Ohio
Vanderbilt University School of Medicine	(1937)		Tennessee
University of Tennessee College of Medicine	(1937)		Tennessee
University of Vermont College of Medicine	(1924)		Connecticut
University of Virginia Department of Medicine	(1936)		W. Virginia
Queen's University Faculty of Medicine	(1932)		W. Virginia

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
College of Medical Evangelists	(1940)		N. B. M. Ex.
Queen's University Faculty of Medicine	(1915)		Newfoundland

* This applicant received the M.B. degree and will receive the M.D. degree on completion of internship.

Miscellany

PROPOSED NEW ADMISSIONS TO THE U. S. P. XII—ALSO "DELETIONS"

In the list of new admissions and deletions which follows, the titles have been arranged, so far as possible, with the basic drugs in alphabetical order and with the preparations grouped under the basic drugs so that the U. S. P. dosage forms of each therapeutically active substance can be known immediately. For convenience, only the English titles have been used, as these were better adapted to the plan of arrangement.

When admitted items are trademarked, the controlled title has been placed in parenthesis after the suggested U. S. P. title for their ready identification when reading this list. It is, of course, contrary to the policy of the Pharmacopeia to include trademarked titles in the U. S. P. itself unless these have been dedicated to the public. Some of the titles used are not definitely adopted, as the Subcommittee on Nomenclature is still giving them consideration. The U. S. P. vehicles, flavors, colors, solvents and other pharmaceutical aids, for the purposes of this report and for information, are placed in a second grouping. Items official in the U. S. P. XI but not admitted to the U. S. P. XII, usually spoken of as "deletions," will be found in the third list. An explanation of why some of these items were deleted from the Pharmacopeia is being given in another communication.

NEW ADMISSIONS TO THE U. S. P. XII

Acetophenetidin Tablets
Acetylsalicylic Acid Tablets
Acid Aminoacetic
Ascorbic Acid Tablets
Ammonium Mandelate Syrup
Nicotinic Acid Tablets
Tannic Acid Solution (for burns)
Adhesive Plaster, Sterile
Alumina Hydrated
Alumina Hydrated, Magma
Ammonium Chloride Capsules
Amphetamine (Benzedrine)
Amphetamine Sulfate
Amphetamine Sulfate Tablets
Atropine Sulfate Tablets
Barbital Tablets
Soluble Barbital Tablets
Bismuth and Potassium Tartrate Injection
Bismuth Subsalicylate Injection
Bismuth Sulfarsphenamine (Bismarsen)
Blood (Normal Human Blood)
Butaprobenz Sulfate (Butyn Sulfate)
Butesin Picrate
Butesin Picrate Ointment
Butyl Aminobenzoate (Butesin)
Caffeine with Sodium Benzoate Injection
Calcium Gluconate Injection
Calcium Mandelate
Calcium Sulfate
Calcium Sulfate Bandage
Capsules (General Chapter)
Carbarsone
Carbon Tetrachloride Capsules
Cascara Sagrada Extract Tablets
Cenopodium Oil Capsules
Chiniofon Tablets (enteric coated)
Chlorazodine (Azochloramide)
Chlorazodine Solution
Citrated Human Plasma
Codeine Phosphate Tablets
Codeine Sulfate Tablets
Colchicine Tablets
Desoxycortone Acetate (Desoxycorticosterone Acetate)
Dextrose Injection
Dextrose and Sodium Chloride Injection
Digitalis Capsules
Digitalis Injection
Digitalis Tablets
Dihydromorphinone Hydrochloride (Dilaudid)
Dihydromorphinone Hydrochloride Tablets
Diphenylhydantoin Soluble (Dilantin Sodium)
Diphenylhydantoin Soluble, Capsules
Emetine Hydrochloride Injection
Ephedrine Sulfate Tablets
Epinephrine Hydrochloride Injection
Epinephrine Hydrochloride, Strong Solution (1:100)
Ergonovine Maleate
Ergonovine Maleate Tablets
Ergonovine Maleate Injection
Ergotamine Tartrate
Ergotamine Tartrate Tablets
Estradiol Benzoate
Estrone
Estrone Injection (in Oil)
Estrone Tablets
Ethyl Aminobenzoate Ointment
Ethyl Carbamate
Eucatropine Hydrochloride (Euphthalmine HCl)
Gauze, Absorbent
Gauze, Absorbent, Sterile
Gauze, Adhesive Absorbent
Gauze Bandage
Globulin, Human Immune
Halibut Liver Oil
Halibut Liver Oil Capsules
Hexylresorcinol
Homatropine Lamels
Human Serum
Injections (General Chapter)
Insulin Injection
Insulin, Crystalline Zinc, Injection
Insulin, Protamine Zinc, Injection
Iron and Ammonium Citrate Capsules
Iron (Ferrous) Sulfate, Exsiccated
Ferrous Sulfate Tablets
Lamels (Eye Disks)
Tribasic Magnesium Phosphate Tablets
Magnesium Trisilicate
Magnesium Trisilicate Tablets
Menadione (Vitamin K Activity)
Menadione Tablets
Mercurin (Pharmaceutic Necessity)
Mercurphylline (Mercupurin Solution)
Mercury Salicylate Injection
Mersalyl (Salyrgan)
Mersalyl with Theophylline Injection
Metarsen (Mapharsen)
Methenamine Tablets
Morphine Sulfate Tablets
Neocinchophen Tablets
Neostigmine Bromide (Prostigmine Bromide)
Neostigmine Bromide Tablets
Neostigmine Methyl Sulfate (Prostigmine M. S.)
Neostigmine Methyl Sulfate Injection
Nicotinamide
Nicotinamide Tablets
Oleovitamin A Capsules
Oleovitamin A and D Capsules
Concentrated Oleovitamin A and D Capsules
Ox Bile Extract Tablets
Ouabain
Ouabain Injection
Soluble Pentobarbital Tablets
Pentothal Sodium
Phenobarbital Elixir
Phenobarbital Tablets
Soluble Phenobarbital Tablets
Phenolsulfonphthalein Injection
Physiological Solution of Chlorides (Ringer's Solution)
Physostigmine Lamels
Picrotoxin
Picrotoxin Injection
Potassium Chloride
Potassium Chloride Tablets
Progesterone
Progesterone Injection
Quinacrine (Atabrine)
Quinacrine Tablets
Quinidine Sulfate Tablets
Quinine Hydrochloride
Quinine Hydrochloride and Ethyl Carbamate Injection
Quinine Sulfate Tablets
Radium
Riboflavine
Riboflavine Tablets
Rice Polishings (Tikitiki)
Rice Polishings Extract
Saccharin Soluble Tablets
Serum, Human Scarlet Fever Immune
Serum, Human Measles, Immune
Sodium Citrate Solution, Sterile
Sodium Nitrite Tablets
Sodium Salicylate Tablets
Sodium Sulfite
Strophanthin Injection
Strychnine Sulfate Tablets
Sulfanilamide Tablets
Sulfarsphenamine
Sulfapyridine
Sulfapyridine Tablets
Sulfapyridine Soluble (Sterile for Injection)
Sulfathiazole
Sulfathiazole Tablets
Sulfbromophthalein (Bromsulphalein) Soluble
Suprarenal Cortex, Extract (Cortin)
Suprarenal Cortex Injection
Surgical Silk
Surgical Silk, Sterile
Suture, Surgical, Synthetic
Suture, Surgical, Synthetic, Sterile
Tablets (General Chapter)
Testosterone Propionate
Testosterone Propionate Injection
Testosterone Propionate Tablets
Tetanus Toxoid
Tetracaine Hydrochloride (Pontocaine HCl)
Tetrachloroethylene
Tetrachloroethylene Capsules
Theobromine with Sodium Acetate
Theobromine with Sodium Acetate Capsules
Theophylline Tablets
Theophylline with Ethylenediamine Tablets
Theophylline with Ethylenediamine Injection
Theophylline with Sodium Acetate Tablets
Thiamine Hydrochloride Elixir
Thiamine Hydrochloride Tablets
Thyroid Tablets
Thyroxine Tablets
Totaquine
Tribromoethanol (Avertin)
Tribromoethanol Solution (Avertin with Amylene Hydrate)
Trichloroethylene (pearls)
Urea
Yeast
Yeast Tablets

NEW VEHICLES, FLAVORS, COLORS, SOLVENTS AND OTHER PHARMACEUTIC AIDS

Amylene Hydrate
Bentonite
Cudbear
Glycyrrhiza Syrup
Ointment, Yellow (Simple Ointment with Yellow Wax)
Ointment (Absorption-base-type)
Soda Lime
Water for Injection

ARTICLES OFFICIAL IN THE U. S. P. XI BUT NOT ADMITTED TO THE U. S. P. XII, COMMONLY SPOKEN OF AS "DELETIONS"

Acetum Scillae
Acidum Aceticum Dilutum
Acidum Acetyltannicum
Acidum Sulfuricum Aromaticum
Aconitum
Acriflavina
Acriflavinae Hydrochloridum
Aethylhydrocupreinae Hydrochloridum
Albumini Tannas
Ammonii Benzoas
Ammonii Bromidum
Ammonii Salicylas
Arseni Triiodidum
Asafoetida
Bismuthi Subgallas
Calcii Bromidum
Calcii Creosotas
Cannabis
Cantharis
Capsicum
Carbromalum
Ceratum Cantharidis
Cinchona
Copaiba
Creosoti Carbonas
Creosotum
Dichloramina-T
Elixir Glycyrrhizae
Emplastrum Cantharidis
Emulsum Asafoetidae
Extractum Cannabis
Extractum Nucis Vomicae
Ferrum
Fluidextractum Belladonnae Radicis
Fluidextractum Cannabis
Galla
Guaiacol
Hydrargyri Iodidum Flavum
Iodoformum
Kino
Liquor Ammonii Acetatis
Liquor Ferri Chloridi
Liquor Ferri Tersulfatis
Liquor Sodii Hypochloritis Dilutus
Magma Ferri Hydroxidi
Massa Hydrargyri
Merbaphenum
Mistura Opii et Glycyrrhizae Composita
Oleum Maydis
Oleum Santali
Paraffinum
Paraffinum Chlorinatum
Pepsinum
Pilulae Aloes
Podophyllum
Potassi Chloras
Pulvis Ipecacuanhae et Opii
Pulvis Sennae Compositus
Pyrogallol
Quinina
Resina Podophylli
Santoninum
Scilla
Serpentaria
Sodii Acetas
Spiritus Aethylis Nitritis
Spiritus Chloroformi
Strychninae Nitras
Sulfonethylmethanum
Sulfur Lotum
Syrupus Ferri Iodidi
Syrupus Scillae
Terebenum
Theobromina cum Sodii Salicylate
Tinctura Aconiti
Tinctura Cantharidis
Tinctura Capsici
Tinctura Cinchonae Composita
Tinctura Ferri Chloridi
Tinctura Kino
Tinctura Scillae
Tinctura Valerianae
Tinctura Veratri Viridis
Unguentum Gallae
Valeriana
Veratrum Viride

PHARMACOPEIAL DELETIONS: ARTICLES OFFICIAL IN THE U. S. P. XI BUT NOT ADMITTED TO THE U S. P. XII

The duties of the Subcommittee on Scope for each pharmacopeial revision are to decide deletions as well as admissions.

Since each pharmacopeia has always been intended to serve as a guide to the medical profession with respect to the best known and most widely used therapeutic agents of the revision period, with efficient preparations for their administration, one of the first duties of the committee is to make a selection of titles and preparations which meet these specifications.

For this purpose the items official in the current pharmacopeia are subjected to critical study and if, in the opinion of at least two thirds of the members of the Subcommittee on Scope, any of these substances or preparations have become obsolete or have been replaced by more efficient new remedies or preparations these items are refused a place in the new pharmacopeia. Such items are usually spoken of as "deletions." It should be understood that "extent of use" alone is not accepted as sufficient reason for the retention of any item in the U. S. P. but that a substance must first measure up to the requirement of therapeutic efficiency established by the U. S. P. when compared with the value of other medicinal substances.

It is true that the vote of a U. S. P. committee represents the opinion of a relatively small group and that these decisions may not always agree with the views of other able physicians, but the number of those voting (twenty-three) and the varied medical knowledge and experience which they represent have established general confidence in the wisdom, soundness and unbiased character of their decisions.

At the request of various individuals and groups an attempt has been made to indicate the reasons why some of the more widely known items were deleted. The following statement has been voluntarily prepared by one of the medical members of the Revision Committee to indicate his personal understanding of the views expressed by those who voted for the deletion of the following items:

Acetyltannic Acid and Albumin Tannate.—These have not proved efficient as intestinal astringents. There is evidence that high up in the small intestine the tannic acid is changed to sodium gallate, which is not astringent. Neither tannic acid nor gallic acid appears in the feces. Any astringent action is likely to be exerted in the stomach or duodenum rather than in the intestine lower down.

Aconite, Tincture of Aconite.—In fever it has been supplanted by strikingly better remedies. As a vagus stimulant it is not employed, probably because of its lack of certainty or its lack of safety in the necessary doses.

Acriflavine and Acriflavine Hydrochloride.—It was employed extensively in World War I, but since that time its use has steadily declined. It is bacteriostatic rather than bactericidal. Recommended to replace iodine as an application to the skin in preparation for operation, it has been refused acceptance by many surgeons. Similarly in infectious and ulcerative conditions of the mouth, bladder, vagina and rectum, its use has steadily declined. The Subcommittee on Surgical Infections of the National Research Council has repudiated it on the ground that it is ineffective in the treatment of wounds.

Ammonium Benzoate, Bromide and Salicylate.—These have been used in the fallacious belief that the ammonium radicle is in some way protective to the heart. Ammonium salts are less stable and unnecessary duplicates of the corresponding salts of potassium and sodium.

Aromatic Sulfuric Acid.—Formerly used extensively as a solvent for quinine sulfate, and now obsolete.

Arsenic Triiodide.—Undesirable to administer both arsenic and iodine in a fixed salt of this type.

Asafetida, Emulsion of Asafetida.—Its value in hysterical conditions is questionable. Its use by mouth for flatulence is not justified by results. Its use by rectum in tympanites can be duplicated by pleasanter smelling and more effective agents.

Bismuth Subgallate.—It has no advantages over the subcarbonate. Because of the presence of gallic acid, it has produced the erroneous idea that it is astringent.

Calcium Bromide.—An unnecessary duplicate with no therapeutic advantages over other bromides.

Calcium Creosotate, Creosote, Creosote Carbonate, Guaiacol.—These and other creosote relatives are neither antiseptic in the respiratory tract nor expectorant. The local antiseptic value of creosote in a tooth cavity and its deodorizing value in pulmonary tuberculosis were not considered justification for its continuation in the Pharmacopeia.

Cannabis, Fluidextract of Cannabis, Extract of Cannabis.—A little used drug, very variable, and with the easily produced undesirable effects characteristic of marihuana indulgence.

Cantharis, Cantharis Plaster, Tincture of Cantharis.—Employed essentially as a local irritant and blistering agent. Blisters have fallen into disuse. As an irritant in scalp lotions and otherwise, the remedy is superfluous.

Capsicum, Tincture of Capsicum.—A local irritant with extensive use, but not considered important enough for the Pharmacopeia.

Carbromal.—A mild sedative, closely related to and differing little from the extensively used and better known barbiturates. The amount of bromine in a dose is altogether too small to give a bromide action.

Cinchona, Compound Tincture of Cinchona.—As antimalarial no longer employed. For the purposes of a bitter, remedies just as effective but simpler are available.

Compound Mixture of Opium and Glycyrrhiza.—Brown mixture represents what now is looked on as an almost extinct type of galenical. In teaspoon doses, its antimony and opium are too little to be therapeutically effective.

Compound Powder of Senna (Compound Licorice Powder).—As a senna preparation it is complicated by the presence of sulfur, which gives an unduly soft consistency to the stools and often a very offensive odor.

Copaiba.—An old time urinary antiseptic, bad tasting and irritating to the stomach and kidneys. It is not a very effective antiseptic in the urinary tract, and simpler and better drugs for the purpose are available.

Dichloramine-T and Dakin's Solution.—Dichloramine-T, the oil-soluble chlorine furnisher, and Dakin's solution (Diluted Solution of Sodium Hypochlorite) were deleted on the ground of their proved inefficiency. The water-soluble Chloramine-T was retained. For the slow and steady elimination of chlorine, Azochloramid in triacetin solution was considered superior and was admitted. The latter is now being extensively employed in Britain in preference to other chlorine antiseptics.

Diluted Acetic Acid.—This was a "pharmaceutic necessity" in the manufacture of Solution of Ammonium Acetate and Vinegar of Squill, both of which have been deleted.

Elixir of Glycyrrhiza.—The Syrup of Glycyrrhiza was substituted for the elixir on the basis of its more extensive employment and its freedom from alcohol.

Ethylhydrocupreine Hydrochloride.—Introduced for the treatment of pneumonia it has proved too toxic for oral or parenteral use, and ineffective. It is still employed as a local application in pneumococcic infections of the eye, but for this use it is rapidly being supplanted.

Extract of Nux Vomica.—Of no use as a bitter, and for a strychnine effect it is more rational to employ strychnine salts.

Fluidextract of Belladonna Root.—The exclusion of this follows the general principle that, where the dose is very small, such concentrated liquid preparations as fluidextracts are undesirable. It was formerly retained for the preparation of Belladonna Liniment, but this is no longer a Pharmacopeial preparation.

Iodoform.—Vile smelling and of low rating as an antiseptic. It is rapidly being replaced by more effective agents which lack the disagreeable odor.

Iron.—This was elementary iron, in the form of fine bright wire, filings or powder. It was used in the preparation of Syrup of Ferrous Iodide, which has been deleted.

Kino, Tincture of Kino.—A tannic acid remedy, which does not reach the lower intestine as such.

Magma of Ferric Hydroxide.—It was introduced as an arsenic antidote. At best it is not very efficient, and there are conflicting reports as to any efficiency at all.

Mass of Mercury (Blue Mass).—Now considered an obsolete mercury galenical preparation.

Merbaphen.—Its use has been largely abandoned in favor of the less toxic and more effective Salyrgan, which is now admitted to the Pharmacopeia.

Nutgall, Nutgall Ointment.—This is employed for its tannic acid, and preparations of the latter are to be preferred.

Oil of Santal.—Irritating to the stomach and kidneys, and not a powerful antiseptic in the urinary tract. Much more effective chemical remedies are now available.

Pepsin.—A powerful enzyme that is superfluous in therapeutics. For the digestion of protein it acts best in an acid medium of p_H 1.5 to p_H 2.5 and does not act at all in a medium above p_H 4.0 to 4.5. In gastric achylia the needed acidity cannot be obtained in the stomach by any doses of acid that it is possible for a patient to swallow.

Pills of Aloe.—Drastic cathartics no longer have Pharmacopeial approval. However, Aloe itself has been retained, and also Aloin, which is not drastic.

Podophyllum, Resin of Podophyllum.—Also a drastic cathartic. Drastics are irritant to the whole alimentary tract, from the stomach down. If catharsis fails to take place, they are capable of producing inflammation of the intestine, and, after absorption, of the kidneys.

Potassium Chlorate.—An antiquated mouth astringent. Any internal use for it is not justified.

Powder of Ipecac and Opium.—Its main use is to produce sweating and sleep. Its ability to induce copious sweating depends mainly on the hot drinks with which it is administered and the heavy covering of bedclothes. The ipecac is nauseating and in this powder can scarcely be said to be used for its expectorant value. The opium is simply "dope," to be better prescribed by itself if it is desired.

Pyrogallol.—Not now much used as an antiseptic in therapeutics.

Quinine.—This is the pure alkaloid, as distinguished from its salts. It is not used in therapeutics and is not required as a "pharmaceutic necessity."

Santonin.—As an anthelmintic it has given place to newer remedies.

Serpentaria.—This was a "pharmaceutic necessity" in the preparation of Compound Tincture of Cinchona, which has been deleted.

Sodium Acetate.—The potassium salt is preferred and much more in use.

Solution of Ammonium Acetate.—Believed to be of no therapeutic value.

Solution of Ferric Chloride, Tincture of Ferric Chloride.—The solution was required for the preparation of the tincture. As an antianemia remedy the tincture has been largely supplanted by iron preparations that do not injure the teeth and are less astringent.

Solution of Iron Tersulfate.—Formerly used as a hemostatic, this makes a nasty mess when mixed with blood and is locally irritating and even corrosive.

Spirit of Chloroform.—Not desirable as a sedative and not needed as a carminative.

Spirit of Ethyl Nitrite.—Not effective as a nitrite and has no distinctive therapeutic properties.

Squill, Syrup of Squill, Tincture of Squill, Vinegar of Squill.—Squill lacks the highest approval as a cardiac drug. Its use as an expectorant is based on erroneous observations.

Strychnine Nitrate.—On account of the efflorescence of the sulfate, the nitrate was admitted to the last revision as a stable salt. However, it has not come into favor, and it was considered unnecessary to admit two strychnine salts.

Sulfonethylmethane.—The limitations and disadvantages of "Trional" as a hypnotic have greatly lessened its use.

Syrup of Ferrous Iodide.—Unsatisfactory as a means of administering either iron or iodine. The dose of each should be separately considered.

Terebene.—Neither antiseptic in the respiratory tract nor valuable as an expectorant.

Theobromine with Sodium Salicylate.—Theobromine with Sodium Acetate is considered better, and it eliminates the chance of harm to diseased kidneys from the salicylic radical.

Valerian, Tincture of Valerian.—Believed to be an overrated drug in hysteria, and too malodorous as a carminative.

Veratrum Viride, Tincture of Veratrum Viride.—A dangerously toxic drug, highly variable and but little used. Its chief employment is in eclampsia, in which extremely large (and dangerous) doses are recommended by its advocates. Reports from many noted obstetricians are not favorable to its use in eclampsia.

Washed Sulfur.—Three forms of sulfur were deemed unnecessary for the Pharmacopeia. Precipitated Sulfur and Sublimated Sulfur are retained.

Yellow Mercurous Iodide.—Formerly extensively administered as an oral antisyphilitic, this remedy has been supplanted by more desirable remedies.

E. FULLERTON COOK.
Chairman of the U. S. P. XII Committee of Revision.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Optometry Practice Acts: Constitutionality of Limitation on Right to Advertise.—The Massachusetts optometry practice act (G. L. c. 112, sec. 73A) prohibits a person, in connection with the sale of eyeglasses, lenses or eyeglass frames, from including in any advertisement (*a*) "any statement advertising a frame or mounting at a fixed price unless a further statement, to the effect that said price is for the frame or mounting only and does not include lenses, eye examination or professional services, is included in said advertisement," or (*b*) "any statement advertising lenses or complete eye glasses including lenses at a fixed price," or (*c*) "any statement which lays claim to a policy or continuing practice of generally underselling competitors." The defendant, a dispensing optician, was convicted of violating these provisions of the act in that he caused the following advertisement to be published in a newspaper: "Eyeglasses complete! White single vision lenses and frames. Complete for only $5. Your choice of ten modern style frames only $2.50. We believe our prices to be those below any competitor," and, in effect, appealed to the Supreme Judicial Court of Massachusetts.

The defendant contended that the statute under which he was convicted was violative of both the state and federal constitutions as a deprivation of liberty and property without due process of law. Ordinarily, said the Supreme Judicial Court, a person has a right to engage in any lawful occupation and may by advertising attempt to create a public demand for his goods or services. Subject to the police power, the right to liberty and property includes the right to engage in any lawful occupation. Included also are the right to make contracts and to advertise the wares and the services furnished, for the purpose of creating a public demand and of inducing the public to trade with the advertiser rather than with some competitor. The defendant was an ordinary trader, not a professional man furnishing professional service or advice. Consequently, continued the court, the reasons on which the denial to a professional man of any right to advertise are based were not applicable to him. A denial of his right to advertise in such a manner as his judgment or his interest might dictate had to be justified, said the court, on one or more of the public needs or interests that together form the basis for what is called the police power. A familiar ground of the regulation or restriction of contracts or of advertising in a commercial business is the prevention of fraud and mistake. Where the public are not cautious or watchful in their buying habits, said the court, and are likely to be misled, the legislature may require not only the absence of active deception but also affirmative measures to prevent misunderstanding. In the opinion of the majority of the court the statutory requirement that one advertising a frame or mounting at a fixed price shall state that the price is for the frame or mounting only and does not include lenses, eye examination or professional services, fell within this principle and was a lawful exercise of the police power. The prohibitions against "advertising lenses or complete eye glasses including lenses at a fixed price" and against advertisements laying "claim to a policy or

continuing practice of generally underselling competitors," were treated together by the court. They were sustained as measures in the interest of the public health, an unquestioned ground for the exercise of the police power. The plain implication of the decision, said the court, is that the state has an interest in seeing that the eyesight of its citizens is not impaired by the use of eyeglasses or lenses unskilfully selected, even by the members of the public themselves. The legislature, concluded the court, was not prepared to prohibit the sale of eyeglasses and lenses as merchandise, to be selected by the buyer. It was prepared, however, to discourage it by eliminating the temptation to and pressure on customers that result from the assurance that no more than a named price will be charged, or that the price is less than competitors ask. Accordingly, the Supreme Judicial Court held the statute to be constitutional, overruled the defendant's exception and sustained the conviction. *Commonwealth v. Ferris, 25 N. E. (2d) 378 (Mass., 1940).*

Dental Practice Acts: Prejudging by Members of Licensing Agency Prior to Hearing in Disciplinary Proceedings.—The Connecticut State Dental Commission suspended Reardon's license to practice dentistry in Connecticut, presumably after notice and hearing. As to just what derelictions Reardon was alleged to have been guilty of the reported decision does not state, nor is that fact here material. On appeal the superior court, Hartford County, Conn., affirmed the order of the dental commission after determining that the commission was warranted in finding proven the grounds on which its action was based, and Reardon appealed to the Supreme Court of Errors, Connecticut.

In general, said the Supreme Court of Errors, the Connecticut dental practice act authorizes the institution of proceedings to suspend or revoke a license to practice dentistry on the written, verified accusation of any person if the commission deems that the charges, if true, will warrant the suspension or revocation of a license. The commission must then fix a time for a hearing on those charges, notify the accused dentist of the time so fixed, serve him with a copy of the charges and afford him at the hearing an opportunity to be heard in his own defense. If a member of the commission learns of any act of a licentiate sufficient to justify, in his opinion, suspension or revocation of a license, he may notify the recorder of the commission and the recorder shall then investigate the facts complained of, reporting the results of his investigation to the commission. If the commission considers the charges sufficient, if true, to justify disciplinary proceedings, it shall direct the recorder to have served on the accused a written complaint of the acts alleged. The procedure in the resulting proceedings shall be as stated when charges are filed by persons other than members of the commission. It was clearly the intent of the legislature, continued the court, that the commission, in acting on the charges made against a licensed dentist, should proceed in a quasijudicial capacity, reaching its conclusion on the evidence produced before it. It was not within legislative contemplation that any of the commissioners, except the recorder, should personally investigate any charges and act on the basis of the information so secured. Such investigation might well lead them to approach the hearing with a preconceived idea of the guilt or innocence of the accused. The accused would, very likely, be placed in the position of having to overcome this preconception by the evidence he might produce. Moreover, such an investigation would be apt to result in a violation of that requirement of due process of law that one called on to answer shall be confronted with the evidence against him. It is true that the dental practice act does not fully carry out this conception of the duties of the commission because it does provide for an investigation by the recorder, and the recorder is a member of the commission. It is, however, clearly the intent of the legislature that the decision of the commission shall be reached on evidence produced at the hearing and contrary to that intent that it shall be based on information obtained, and submitted to the commission, by its members. In this case, the trial court found that at the hearings before the commission no oral evidence was produced other than the unsworn statements of the members of the commission. The evidence showed that two members of the commission, not including the recorder, testified at length as to the results of their personal investigation concerning the facts complained of against the accused dentist. It appears that the members had discussed the matter among themselves before the hearing. Three members of the commission stated that before the hearing was held they had formed a definite opinion as to the guilt or innocence of the accused dentist and from answers given by those members of the commission to questions propounded by the dentist's attorney there is no doubt that the burden was placed on the accused dentist of overcoming the opinion they arrived at before the hearing. The very result which the legislature intended should not happen came to pass in this case. The accused dentist did not have such a hearing before the commission as the dental practice act contemplates, and the violation by the commission of proper procedure was so fundamental that, whether or not the accused dentist had been guilty of violating the prohibitions of the dental practice act, the trial court should have sustained his appeal.

In effect, then, the Supreme Court of Errors reversed the order of the commission suspending the dentist's license to practice.—*Reardon v. Dental Commission, 20 A. (2d) 622 (Conn., 1941).*

Society Proceedings

COMING MEETINGS

American Academy of Ophthalmology and Otolaryngology, Chicago, Oct. 19-23. Dr. William P. Wherry, 107 South 17th St., Omaha, Executive Secretary.

American Academy of Pediatrics, Boston, Oct. 8-11. Dr. Clifford G. Grulee, 636 Church St., Evanston, Ill., Secretary.

American Association of Obstetricians, Gynecologists and Abdominal Surgeons, Hot Springs, Va., Sept. 11-13. Dr. James R. Bloss, 418 Eleventh St., Huntington, W. Va., Secretary.

American Association of Railway Surgeons, Chicago, Sept. 8-10. Dr. Daniel B. Moss, 547 West Jackson Blvd., Chicago, Secretary.

American Clinical and Climatological Association, Skytop, Pa., Oct. 16-18. Dr. Francis M. Rackemann, 263 Beacon St., Boston, Secretary.

American Hospital Association, Atlantic City, N. J., Sept. 15-19. Dr. Bert W. Caldwell, 18 East Division St., Chicago, Executive Secretary.

American Public Health Association, Atlantic City, N. J., Oct. 14-17. Dr. Reginald M. Atwater, 50 West 50th St., New York, Executive Secretary.

American Roentgen Ray Society, Cincinnati, Sept. 23-26. Dr. Carleton B. Peirce, Royal Victoria Hospital, Montreal, Canada, Secretary.

Association of Military Surgeons of the United States, Louisville, Ky., Oct. 29-Nov. 1. Colonel James M. Phalen, Army Medical Museum, Washington, D. C., Secretary.

Central Association of Obstetricians and Gynecologists, New Orleans, Oct. 2-4. Dr. William F. Mengert, 515 Newton Road, Iowa City, Secretary.

Clinical Orthopaedic Society, Cleveland and Akron, Ohio, Oct. 3-4. Dr. Myron O. Henry, 825 Nicollet Ave., Minneapolis, Secretary.

Colorado State Medical Society, Estes Park, Sept. 17-20. Mr. Harvey T. Sethman, 537 Republic Bldg., Denver, Executive Secretary.

Delaware, Medical Society of, Wilmington, Oct. 7-8. Dr. C. L. Munson, 1015 Washington St., Wilmington, Secretary.

District of Columbia, Medical Society of the, Washington, Sept. 30-Oct. 2. Mr. Theodore Wiprud, 1718 M Street N.W., Washington, Secretary.

Indiana State Medical Association, Indianapolis, Sept. 23-25. Mr. Thomas A. Hendricks, 23 East Ohio St., Indianapolis, Executive Secretary.

Kentucky State Medical Association, Louisville, Sept. 29-Oct. 3. Dr. Arthur T. McCormack, 620 South Third St., Louisville, Secretary.

Michigan State Medical Society, Grand Rapids, Sept. 16-19. Dr. L. Fernald Foster, 2020 Olds Tower, Lansing, Secretary.

Mississippi Valley Medical Society, Cedar Rapids, Iowa, Oct. 1-3. Dr. Harold Swanberg, 510 Maine St., Quincy, Ill., Secretary.

Nevada State Medical Association, Elko, Sept. 26-27. Dr. Horace J. Brown, P. O. Box 698, Reno, Secretary.

Omaha Mid-West Clinical Society, Omaha, Oct. 27-31. Dr. J. D. McCarthy, 1036 Medical Arts Bldg., Omaha, Secretary.

Pacific Association of Railway Surgeons, Salt Lake City, Sept. 12-13. Dr. W. T. Cummins, 1400 Fell St., San Francisco, Secretary.

Pennsylvania, Medical Society of the State of, Pittsburgh, Oct. 6-9. Dr. Walter F. Donaldson, 500 Penn Ave., Pittsburgh, Secretary.

Tri-State Medical Society of Texas, Louisiana and Arkansas, Texarkana, Sept. 23-24. Dr. William Hibbitts, 209 Pine St., Texarkana, Tex., Secretary.

Vermont State Medical Society, Burlington, Oct. 2-3. Dr. Benjamin F. Cook, 154 Bellevue Ave., Rutland, Secretary.

Virginia, Medical Society of, Virginia Beach, Oct. 6-8. Miss A. V. Edwards, 1200 East Clay St., Richmond, Secretary.

Wisconsin, State Medical Society of, Madison, Sept. 10-12. Mr. G. B. Larson, 110 East Main St., Madison, Acting Secretary.

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis

21:689-848 (June) 1941

*Association of Gallbladder Disease and of Peptic Ulcer with Coronary Disease: Postmortem Study. B. J. Walsh, E. F. Bland, A. C. Taquini and P. D. White, Boston.—p. 689.

Common Electrocardiographic Variant Following Acute Myocardial Infarction—The T$_X$ Type. H. B. Weinberg and L. N. Katz, Chicago. —p. 699.

Mural Thrombi in Heart. C. F. Garvin, Cleveland.—p. 713.

Therapeutic Venous Occlusion. R. R. Linton, P. J. Morrison, H. Ulfelder and A. L. Libby, Boston.—p. 721.

*Studies on Peripheral Blood Flow. E. J. Baldes, J. F. Herrick, H. E. Essex and F. C. Mann, Rochester, Minn.—p. 743.

*Vasodilating Action of Various Therapeutic Procedures Which Are Used in Treatment of Peripheral Vascular Disease: Plethysmographic Study. D. I. Abramson, Cincinnati; H. Zazeela, New York, and N. Schkloven, Cincinnati.—p. 756.

Venous Stasis in Coronary Circulation: Experimental Study. C. S. Beck and A. E. Mako, Cleveland.—p. 767.

Significance of Diagnostic Tests in Study of Peripheral Vascular Disease. H. Montgomery, M. Naide and N. E. Freeman, Philadelphia.—p. 780.

Gallbladder Disease, Peptic Ulcer and Coronary Disease.—Walsh and his associates examined the protocols of 2,737 complete necropsies of persons 20 or more years of age. There were 576 patients with atherosclerosis of the coronary arteries of sufficient degree to be considered grossly abnormal. There were 456 patients with structurally abnormal gallbladders. In 122 instances coronary disease and gallbladder disease were observed in the same person. Peptic ulcer was present in 149. It is apparent that gallbladder disease occurred almost twice as often in patients with coronary disease as in those with normal coronary arteries. Some factor or factors related, in part at least, to an aging process not yet elucidated are apparently responsible for this finding. There was no significant association of peptic ulcer and coronary disease. In contrast to the structural alterations produced in the gallbladder, the upper part of the intestinal tract and the coronary arteries of animals no conclusive evidence of a comparable association in man was apparent from the present study.

Peripheral Blood Flow.—Using a thermostromuhr, Baldes and his co-workers measured the flow of blood in large arteries or veins of the peripheral vascular system of a trained dog. The data presented emphasize the fact that the blood flow to an extremity is influenced by many factors, any one of which, if altered, may profoundly increase or decrease the flow of blood to that region. Some of the factors that increase the flow are thyrotoxicosis, ingestion of food and exercise. Reduction in the size of the lumen of an artery reduces blood flow. Epinephrine may increase, decrease or cause no significant change, according to the resultant effect of the various factors controlling blood flow. The change in blood flow due to epinephrine is transient. Pitressin subcutaneously or intramuscularly exerts no significant effect on the blood flow. If it is administered intravenously the effect on every blood vessel studied thus far is a decided decrease in flow. The flow in the femoral artery or vein decreases as much as 90 per cent and remains decreased for several minutes, when 1 pressor unit of pitressin is injected intravenously.

Peripheral Vascular Disease.—Abramson and his associates investigated some of the vasodilating drugs commonly used in the treatment of peripheral vascular disease by means of the venous occlusion plethysmographic method. Blood flow measurements were performed on 31 patients with various types of peripheral vascular disease (chiefly thromboangiitis obliterans and Raynaud's disease), 13 with various mental states and 34 normal subjects. A single administration of calcium gluconate, a deproteinated pancreatic extract (Padutin), papaverine, a preparation containing pantopon and atropine (spasmalgin) and thiamine hydrochloride produced slight or no increases in the blood flow to the hand, forearm, leg and foot. Alcohol, stilbestrol and histamine generally increased the blood flow to the hand but not to any other portions of the extremities. Hypertonic solution of sodium chloride augmented the flow to the hand, leg and foot in only one third of the trials. The intermittent application of a venous occlusion pressure for from two to three hours did not result in a significant increase in peripheral blood flow. The commonly employed clinical methods (the skin temperature thermometer and the oscillometer) do not necessarily reflect or parallel changes in total blood flow to an extremity.

American J. Obstetrics and Gynecology, St. Louis

41:915-1110 (June) 1941. **Partial Index**

Fracture of Femoral Neck Following Roentgen Therapy for Gynecologic Malignancy. H. Strauss and J. L. McGoldrick, Brooklyn. —p. 915.

Prevention of Asphyxia Neonatorum: Study of Etiologic Factors Observed in 2,000 Consecutive Deliveries. C. J. Lund, Madison, Wis.—p. 934.

*Value of Calcium in Labor and in Uterine Inertia. G. D. Patton and R. D. Mussey, Rochester, Minn.—p. 948.

Use of Synthetic Vitamin E in Treatment of Abortion. S. Lubin and R. Waltman, Brooklyn.—p. 960.

Attempt at Endocrine Correlation and Therapy in 125 Cases of Menstrual Disorders. H. I. Segal, A. Steinberg, F. R. Schecter, N. H. Colton and N. Pastor, Philadelphia.—p. 979.

*Treatment of Abnormal Uterine Bleeding with Androgens: Therapeutic Evaluation of Testosterone Propionate, Methyl Testosterone, Ethinyl Testosterone and Androgen Implantation. U. J. Salmon, S. H. Geist, J. A. Gaines and R. I. Walter, New York.—p. 991.

Clinical Study of Estrogenic Therapy with Pellet Implantation. D. R. Mishell, Newark, N. J.—p. 1009.

Clinical Experiments with Diethylstilbestrol: II. Treatment of Uterine Bleeding. A. Palmer, San Francisco.—p. 1018.

Psychogenic and Somatogenic Factors in Flushes of Surgical Menopause. S. R. M. Reynolds, S. Kaminester, Frances I. Foster and S. Schloss, Brooklyn.—p. 1022.

Sterilization by Means of Peritoneoscopic Tubal Fulguration: Preliminary Report. F. H. Power and A. C. Barnes, Ann Arbor, Mich. —p. 1038.

Studies in Pelvic Iontophoresis of Choline Compound: II. Preoperative Management of Uterine Myomas Complicated by Pelvic Infection: Report of Thirty-Nine Cases. C. A. Gordon and A. R. Rosenthal, Brooklyn.—p. 1043.

Reliability of Fishberg Concentration Test in Normal Pregnancy and Puerperium. A. S. Velkoff and R. F. Mabon, Atlanta, Ga.—p. 1069.

Calcium in Labor and Uterine Inertia.—Patton and Mussey administered calcium gluconate salts intravenously to 26 women in labor to determine its effect on pain and on uterine contractility. The women were at or near term and were either in labor or were undergoing induction. No relief of labor pains followed the therapy; in many instances the intensity of the pain was increased. The effect on uterine contractions was one of stimulation. Twenty-four patients experienced an increase in the frequency of contractions and 15 an increase in the intensity of the contractions. The duration of each contraction was not greatly changed from that in average labor. In no case did tetanic spasm of the uterus occur. The administration of calcium is most useful in stimulating the uterus in the presence of inertia in the first or second stage of labor. It cannot be expected to overcome severe dystocia. Concomitant analgesic agents may defeat the purpose of calcium in some cases of uterine inertia. The calcium apparently has no ill effect on the newborn babies. It should not be administered if a drug of the digitalis group has already been given.

Androgens for Abnormal Uterine Bleeding.—Salmon and his colleagues used testosterone propionate in the treatment of 61 patients with menometrorrhagia. The diagnosis in 45 was functional bleeding, in 15 menometrorrhagia associated with uterine fibroids and in 1 adenomyosis of the uterus. Good primary therapeutic results were obtained in 97.7 per cent of the patients with functional bleeding. Apparent cures (follow-up varied from three to thirty-two months) were obtained in 66.6 per cent, moderate improvement in 26.6 per cent and failure in 6.8 per cent of these patients. The primary results of 87 per

cent of the patients with uterine fibroids were good, but when the treatment was discontinued the symptoms of 60 per cent recurred. Implants of crystals and pellets of testosterone and testosterone propionate gave unsatisfactory results. The symptoms of the patient with menorrhagia and adenomyosis were controlled while under treatment, but the excessive bleeding recurred after the testosterone was discontinued. The authors believe that the effect of androgens on the normal steroid sex hormone balance of the human female is achieved through a combination of three actions: (1) inhibition of the gonadotropic activity of the hypophysis which results in suppression of ovulation and estrogen formation, (2) inactivation of the estrogens (or nullification of their biologic effects) and (3) inhibition of the proliferative capacity of the endometrium. When administered in small doses which do not suppress menstruation, testosterone propionate produces a qualitatively similar, though less profound, effect. The conclusion seems warranted that, following the administration of testosterone, a readjustment occurs in the steroid sex hormone organization which results in the establishment of a normal pituitary-ovarian-uterine relationship. Depending on the dose administered, testosterone propionate tends to modify or nullify the action of the gynecogenic hormones. The authors conclude that the endogenous androgens of the human female perform a function which is analogous to the action of exogenous androgens (testosterone propionate).

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

45:801-952 (June) 1941

Carcinoma of Uterine Cervix Treated with 400 Kilovolt Roentgen Rays and Radium. J. T. Murphy and C. E. Hufford, Toledo, Ohio.—p. 801.

*Carcinoma of Cervix Uteri: Study of 727 Cases. H. G. F. Edwards, Shreveport, La.—p. 804.

Results in Treatment of Lymph Node Metastasis in Cancer of Cervix and Vulva. F. J. Taussig, St. Louis.—p. 813.

*Carcinoma of Cervix Uteri in Childhood and Adolescence. H. H. Bowing and J. A. L. McCullough, Rochester, Minn.—p. 819.

*Roentgen Irradiation of Cellulitis, Especially of Face and Neck. W. DeHollander, Springfield, Ill.—p. 831.

Roentgen Diagnosis of Nonopaque Foreign Body in Lower Respiratory Tract. A. E. Morrison, Marion, Ohio, and H. J. Walton, Baltimore. —p. 843.

Chylous Ascites: Roentgenologic Observations from Case in Infancy. G. M. Wyatt and R. E. Gross, Boston.—p. 848.

Osteogenesis Imperfecta: Report of Twelve Cases. L. K. Chont, Oklahoma City.—p. 850.

Congenital Hydrocephalus: Report of Two Cases. P. A. Robin, Hempstead, N. Y.—p. 862.

Cobra Venom in Relief of Pain Due to Cancer. P. J. Hodes and Rosalind S. Thorner, Philadelphia.—p. 866.

Advantages of Roentgenoscopy and Roentgenoscopic "Spot" Roentgenograms in Diagnosis of Early Pulmonary Tuberculosis. R. H. Stiehm, Madison, Wis.—p. 871.

Method for Location and Measurement of Intrapulmonary Cavities and Foreign Bodies. J. E. Noll, Port Jervis, N. Y.—p. 881.

Effects of Roentgen Irradiation at Low Temperature on Skin of Young Rats. T. C. Evans, Iowa City.—p. 888.

Sensitometry of Roentgen Film and Interpretation of Sensitometric Data. G. C. Henny, Philadelphia.—p. 895.

Comparison of Certain Aspects of 200 and 400 Kilovolt Radiation. C. C. McClure, Nashville, Tenn.—p. 909.

Method of Simplified Depth Dosage Calculation for Clinical Purposes. G. E. Roth, Christchurch, New Zealand.—p. 915.

Carcinoma of Cervix Uteri.—Edwards presents an analysis of 727 cases of cancer of the cervix seen during eight years; 265 patients were white and 462 Negroes. Biopsies were carried out on all but 26. Of the cancers, 670 were epidermoid carcinomas; 435 were of grade 2, 172 of grade 3, 21 of grade 4 and 42 were not graded. There were 31 patients with adenocarcinoma. In 75 per cent of the total the disease was in an advanced stage. In treatment dependence was placed on intensive, protracted, high voltage roentgen therapy. Less than half of the patients received radium therapy in addition. Thirty-eight, or 20.1 per cent, of the 189 patients treated in 1932, 1933 and 1934 were living on April 30, 1940. Of the 39 patients first seen in 1932 5, or 12.56 per cent, were alive at this time; of the 78 patients first seen in 1933 13, or 16.67 per cent, and of the 72 patients first seen in 1934 20, or 27.77 per cent, were living then. The author concludes that his data do not indicate that educational efforts are succeeding in causing patients to come for treatment earlier. The signs of early cancer are objective, and early diagnosis can be made only on vaginal examination by a physician trained to detect early cancer, aided by microscopic study, at a time when the patient does not complain of any symptoms. He advocates semiannual examination of all women more than 35 years of age.

Carcinoma of Cervix Uteri in Childhood and Adolescence.—Bowing and McCullough point out that among 3,000 patients with malignant neoplasms of the uterine cervix referred to the Mayo Clinic only 1 instance of cancer in a patient less than 20 years of age was found. This occurred in a white girl of 13. The case emphasizes the need of making a careful manual and visual examination, as well as microscopic and pathologic examination of any tissue which may be at all suspicious. They believe that, because of the rarity of the disease among patients 20 or less years of age and of the difficulties encountered in making the diagnosis and the emphasis placed on the so-called cancer age, the diagnosis of cancer among young women is frequently confused or missed entirely. A search of the literature since 1862 revealed 25 cases of carcinoma of the uterine cervix in girls 20 years of age or younger. The authenticity of some of these cases appears doubtful, and in many there is no record of a corroborative microscopic examination. The tumor in the case reported was a stage 1 modified lesion, whereas in most cases of carcinoma of the cervix the lesions are in the inoperable stage when the patients are first seen. The response of the patient to radium therapy corresponded to that of patients who had a modified stage 1 lesion in the larger group of cases; all the patients in the latter group were alive five or more years after treatment. Individualization in the management of such patients is most imperative. The total dose of radium delivered was 676 millicurie hours. No apparent systemic effect resulted from the irradiation. At the time of writing, more than six years from the time of the initial treatment, the patient is well, menstruation is normal and she is apparently free from malignant disease.

Roentgen Irradiation of Cellulitis.—DeHollander reports 18 cases of acute cellulitis of tissues surrounding the alveolar process. In 12 it followed the extraction of teeth and intraoral surgery. In 8 of these roentgen irradiation was begun by the third day of onset. The remaining 4 had first been treated by hot compresses and the like, and they had the cellulitis for from seven to fourteen days before roentgen irradiation was instituted. The response of both groups was satisfactory and resulted in cure of all but 1 patient. Cellulitis of the other 6 patients followed slight abrasions or lacerations to the skin of the chin, face, eye, neck or ear or after an infected area was opened. Response to irradiation by all the 18 patients began within twenty-four hours. The patient first experiences an increase in pain, which persists for from six to ten hours, and at times an elevation of temperature. In twenty-four hours relief of pain is usually remarkable. The patient who was not cured died of the infection and complications. The amount of swelling decreases noticeably in from twenty-four to forty-eight hours. With this decrease the patient begins to feel an improvement and there is less toxicity. The swelling is not always absorbed. Absorption without suppuration occurred in only 7 patients; in 10 fluctuation occurred and opened spontaneously or was incised. It is best to treat the entire area at one time, but if the area of cellulitis is larger than 20 by 20 cm. it must be divided into two parts. When dealing with a cellulitis of the face or neck it may often be necessary to treat both sides. The initial dose is approximately three fourths of a skin erythema dose. This is given in an attempt to destroy as many of the invading leukocytes as possible and liberate the greatest amount of protective substance. The author has given his patients an initial dose of 289 roentgens. After forty-eight hours he again treated the area of cellulitis but this time the dose was reduced to 193 roentgens, or about one half of a skin erythema dose. The total dose is given within forty-eight hours, and not less than thirty-six hours should elapse between doses.

Anesthesiology, New York

2:369-488 (July) 1941

Regional Block Anesthesia for Operations on Perineum, Anus, Genitalia and Lower Extremities. E. B. Tuohy, Rochester, Minn.—p. 369.
Hepatorenal Syndrome Following Administration of Vinethene: Case Report. M. H. Hawk, O. S. Orth and F. J. Pohle, Madison, Wis.—p. 388.
Unsaturated Monohalogenated Hydrocarbons as General Anesthetic Agents. B. E. Abreu, Oklahoma City.—p. 393.
Technical Development of Gas Anesthesia. A. H. Miller, Providence, R. I.—p. 398.
Survival of Hypothermia by Dog. L. M. Woodruff, New Haven, Conn.—p. 410.
Physiologically Controlled Oxygen Mask Apparatus. A. L. Barach and M. Eckman, New York.—p. 421.
Combined Action of Morphine and Central Stimulants and Its Relation to Treatment of Morphine Poisoning. L. W. Hazleton and T. Koppanyi, Washington, D. C.—p. 427.
First Anesthesia Death with Some Remarks Suggested by It on Fields of Laboratory and Clinic in Appraisal of New Anesthetic Agents. H. K. Beecher, Boston.—p. 443.
Study of Carbon Dioxide Absorption Appliances for Anesthesia: The Canister. J. Adriani and Mary Lou Byrd, New York.—p. 450.
Determination of Dosage-Mortality Ratio of Pentothal Sodium with Toxic Doses of Sulfanilamide Following. P. H. Lorhan, Gretchen Guernsey and A. E. Pugh, Kansas City, Kan.—p. 456.

Annals of Surgery, Philadelphia

113:881-1130 (June) 1941

Mars and Aesculapius. D. Cheever, Boston.—p. 881.
Surgical Problems of the War. L. R. Broster, London, England.—p. 891.
Surgery of Air Raid Casualties. D. N. Matthews, London, England.—p. 910.
Treatment of Compound Fractures Resulting from Enemy Action. P. D. Wilson, New York—p. 915.
Experience of Canadian Army and Pensions Board with Amputations of Lower Extremity. W. E. Gallie, Toronto, Canada.—p. 925.
Minor Causalgia Following Injuries and Wounds. J. Homans, Boston.—p. 932.
Present Day Treatment of Compound Fractures. R. H. Kennedy, New York.—p. 942.
*Use of Adrenal Cortical Extract in Treatment of Traumatic Shock of Burns. J. E. Rhoads, W. A. Wolff and W. E. Lee, Philadelphia.—p. 955.
*Therapeutic Value of Preserved Blood Plasma: Summary of 110 Cases. E. B. Mahoney, H. D. Kingsley and J. W. Howland, Rochester, N. Y.—p. 969.
*Bipp and Liquid Paraffin Treatment of War and Civilian Wounds. F. B. Gurd and L. H. McKim, Montreal, Canada.—p. 987.
Emergency Treatment of War Injuries of Face and Jaws. R. H. Ivy and R. A. Stout, Toronto, Canada.—p. 1001.
Medical Department in Naval Warfare. F. R. Hook, Washington, D. C.—p. 1010.
Organization for Evacuation and Treatment of War Casualties. N. T. Kirk, Washington, D. C.—p. 1020.
Skin Grafting and "Three Quarter" Thickness Skin Graft for Prevention and Correction of Cicatricial Formation. E. C. Padgett, Kansas City, Mo.—p. 1034.
Treatment of Compound Injuries by Closed Plaster Encasement Method. D. B. Pfeiffer and C. M. Smyth Jr., Philadelphia.—p. 1050.

Adrenal Cortex Extract for Traumatic Shock of Burns.—Rhoads and his colleagues endeavored to control quantitatively the fluid shift of burned patients by frequent serial hematocrit and plasma protein determinations and thus to calculate how large a plasma transfusion was required to restore these levels to normal. By giving large plasma transfusions at varying intervals after burns they found that about forty hours was required for the capillary walls to regain their normal state of permeability for proteins. To shorten this time they administered adrenal cortex extract to 26 patients with extensive burns. The burned area was debrided and tanned, and the patient placed under a thermoregulated cradle. Hematocrit and plasma protein levels were determined at intervals of six hours for forty-eight hours and less frequently thereafter. A continuous infusion of citrated blood plasma, diluted with an equal volume or more of 5 per cent dextrose in distilled water or with 0.85 per cent sodium chloride, was given in amounts to keep the hematocrit below 55 and the plasma protein level above 6 Gm. per hundred cubic centimeters. Adrenal cortex extract was started intravenously in 7 patients within a few hours of injury. The dosage varied from 5 to 10 cc. every six hours for adults, and in proportionate amounts for children. The plasma given 5 patients compared to the calculated plasma loss, and 2 received decidedly smaller amounts. Three of the 5 patients showed a sharp rise in the plasma volume between the eighteenth and thirtieth hours, with a normal or near normal level between the twenty-fourth and thirtieth hours; 1 showed an early rise of 15 per cent, followed by a considerable "lag period," and 1 showed a definite rise from the eighteenth to the twenty-fourth hour. One patient showed no benefit and 1 showed fairly complete retention of the plasma after the twenty-fourth hour. The patient who failed to respond had several concomitant diseases. In comparing the curves of these 7 patients with the 19 who had comparable burns and who were similarly treated but received no cortex extract, it appears that in not 1 instance of the latter group was it possible to obtain a substantial rise in the plasma volume before the thirty-sixth hour without a rapid loss of protein. The volume of plasma of patients with burns involving less than 5 per cent of their body surface became normal only within forty-eight to seventy-two hours, for those with more than 10 per cent involvement the time ranged between four and six days, for those with 15 to 20 per cent involvement but given adequate transfusions of plasma the circulation was normal in less than fifty hours, and the time of those patients receiving adequate plasma and adrenal cortex extract was normal between the eighteenth and thirtieth hours. Adrenal cortex extract reduces the amount of plasma required to restore the circulation to normal, reduces the amount of plasma protein which enters the interstitial fluid and shortens the period of stagnant anoxia. A definite chloride retention occurs. None should be given these patients unless indicated by blood analysis.

Preserved Blood Plasma.—Mahoney and his co-workers have dried plasma successfully with an apparatus built in their laboratory, based on the lyophile method. Plasma need not be preserved in the dry form for use. Wet plasma may be safely stored under sterile conditions at 4 C. for from three to four months. However, dried plasma deteriorates slowly, it requires no refrigeration for storage, it may be stored indefinitely, it is easily transported and it dissolves readily in a concentrated solution. Plasma has a far greater field of usefulness than serum in the treatment of emergency shock. They have given three hundred and forty plasma transfusions to 110 patients. One patient was given forty-five transfusions. The maximal amount injected at any one time was 800 cc. There were twelve mild and transient reactions; 9 of the patients had a chill followed by fever and 3 had transient urticaria. The plasma has been most useful in restoring a failing circulation and in combating shock from operations, burns, trauma and hemorrhage. Lyophile plasma (dried within a few hours after its collection) was effectively used in treating hemorrhagic disease of 4 newborn infants. The following are a few precautions in administering plasma: 1. Wet plasma should not be heated above 37 C. prior to injection. 2. Dried plasma should never be regenerated with Ringer's solution. 3. Plasma should be injected slowly and preferably by the drip method. 4. Transfusions of whole blood should not follow pooled plasma immediately, as heterogenous agglutinins may cause severe reactions. If imperative, type O blood should be used. 5. Plasma showing excessive hemolysis should be discarded.

Bipp and Liquid Petrolatum Treatment for Wounds.—Gurd and McKim discuss the use of bipp (one part of bismuth subnitrate, one part of iodoform powder and one part of liquid petrolatum) packing in the treatment of civilian and war wounds. They present illustrative cases of suppurating phlegmonous lesions of the hand, lacerated contaminated wounds of the leg and pulmonary abscesses. The advantages of bipp and liquid petrolatum pack treatment are relief of pain, stimulation of a healthy reaction on the part of the tissues, control of the original infection and the fact that usually dressings need to be changed only in from three to six weeks, thus lessening infection. Such wounds are not malodorous. The employment of the bipp-liquid petrolatum technic is specifically recommended for (1) acute traumatic lesions whether due to gunshot wounds, automobile injuries or construction accidents associated with potential infection and particularly with compound fractures, (2) infected wounds resulting from untreated trauma or suppurating or phlegmonous wounds from other causes and (3) as a prophylactic measure against infection of the wall of the body when certain infected cavities, such as abdominal abscesses (appendical or otherwise), empyema or lung abscesses are opened, and when operating on the mastoid or other deep-seated abscesses.

Archives of Internal Medicine, Chicago

67:1099-1302 (June) 1941

Fulminating Bacillus Coli Septicemia in Women with Diabetes: Report of Four Cases, with Special Reference to Clinical Diagnosis. B. D. Bowen and E. Witebsky, Buffalo.—p. 1099.
Pulmonary Stenosis with Bundle Branch Block: Report of Case with Sound Tracings and Semiserial Studies of Conduction Bundle. L. M. Blackford and F. P. Parker, Atlanta, Ga.—p. 1107.
Syndrome of Destruction of Pineal Gland: Experimental and Clinical Observations. J. Martin and L. Davis, Chicago.—p. 1119.
Vital Capacity of Lungs in Middle Age: Results of Periodic Examinations of Men of Sedentary Occupation. J. H. Arnett, Philadelphia.—p. 1129.
Effect of Uremic Serum and Urine on Growth of Fibroblasts in Vitro. M. Rachmilewitz, with assistance of E. Nussbaum, Jerusalem, Palestine.—p. 1132.
Infarction of Lung: Clinical and Roentgenologic Study. G. R. Krause and E. M. Chester, Cleveland.—p. 1144.
Cold Pressor and Breath Holding Test: Analysis of Results in 200 Subjects. R. H. Feldt and D. E. W. Wenstrand, Milwaukee.—p. 1157.
Thrombosis of Common, Internal and External Carotid Arteries: Report of Two Cases with Review of Literature. M. Galdston, S. Govons, S. B. Wortis, J. M. Steele and H. K. Taylor, New York.—p. 1162.
Blood: Review of Recent Literature. S. M. Goldhamer, C. C. Sturgis and F. H. Bethell, Ann Arbor, Mich.—p. 1177.

Archives of Neurology and Psychiatry, Chicago

46:1-196 (July) 1941

Multiple Degenerative Softening: Clinicopathologic Report of Three Cases. G. B. Hassin and T. T. Stone, Chicago.—p. 1.
Dietetic and Related Studies on Multiple Sclerosis. R. M. Brickner and N. Q. Brill, with assistance of Frances N. Naylor and Kathryn Montgomery, New York.—p. 16.
*Lindau-von Hippel Disease: Report of Four Cases. W. M. Craig, H. P. Wagener and J. W. Kernohan, Rochester, Minn.—p. 36.
Incidence and Cause of Death in Shock Therapy. J. L. Kinsey, Milwaukee.—p. 55.
Multiple Primary Tumors of Spinal Cord. B. W. Lichtenstein, Chicago.—p. 59.
Cerebrospinal Fluid Dynamics in Man. E. Roseman, M. Rosenbaum, C. D. Aring and E. B. Ferris Jr., Cincinnati.—p. 72.
Prevention of Traumatic Complications in Convulsive Shock Therapy by Magnesium Sulfate. H. E. Yaskin, Philadelphia.—p. 81.
Prognostic Value of Intravenous Administration of Sodium Amytal in Cases of Schizophrenia. J. S. Gottlieb and J. M. Hope, Iowa City.—p. 86.
Histogenesis of Senile Plaques. T. L. L. Soniat, Rochester, Minn.—p. 101.
Occlusion of Superior Cerebellar Artery: Report of Case with Necropsy. W. Freeman and D. Jaffe, Washington, D. C.—p. 115.

Lindau-von Hippel Disease.—Craig and his associates describe 4 cases of hemangioblastoma of the cerebellum associated with angiomatous lesions of the retina. Surgical intervention was made in all 4, resulting in the death of 1 patient twelve hours after the operation. The presence of multiple pathologic lesions doomed any form of treatment to failure in this case. The fatal case was a classic example of the Lindau-von Hippel syndrome except for the presence of a cyst in the cerebellar hemangioblastoma. In this case were also seen two hemangioblastomas without lipoid-containing cells. The surgical procedure employed in the other 3 cases was the more or less standardized drainage of the cystic cavities, removal of the tumorous nodule and removal of the wall of the cyst. The postoperative results were excellent and functional recovery was remarkable. From the ophthalmoscopic point of view these 4 patients presented four distinct phases of the disease. The authors state that the terminology "Lindau-Collins" would have been just as good as the one selected as a title, since Collins was the first to describe retinal angiomatosis.

Archives of Ophthalmology, Chicago

25:941-1108 (June) 1941

Bullous Keratitis, with Particular Reference to Pathology of Experimental Corneal Vesiculation. D. G. Cogan, Boston.—p. 941.
Rhinosporidium Seeberi Infection in Eye. N. B. Elles, Houston, Texas.—p. 969.
Exfoliation of Lens Capsule (Glaucoma Capsulare): Report of Two Cases Bearing on Etiology, Nature and Significance of Condition. R. Irvine, Los Angeles.—p. 992.
Bilateral Glaucoma Associated with Unilateral Naevus Flammeus: Report of Case. L. H. Ehrlich, New York.—p. 1002.
Fluorescence Microscopy Applied to Ocular Tissues. J. N. Evans and E. Singer, Brooklyn.—p. 1007.
Optic Neuritis Caused by Coal Tar Hair Dye. M. Keschner and V. H. Rosen, New York.—p. 1020.
Penetration of Sulfanilamide and Its Derivatives into Aqueous Humor of Eye. H. G. Scheie and B. F. Souders, Philadelphia.—p. 1025.
Simulated Blindness. M. A. Lasky, Brooklyn.—p. 1038.

Arkansas Medical Society Journal, Fort Smith

38:1-38 (June) 1941

The Future of Organized Medicine in Arkansas. H. T. Smith, McGehee.—p. 1.
Conservative Rhinology. P. L. Mahoney, Little Rock.—p. 2.

Canadian Medical Association Journal, Montreal

44:547-648 (June) 1941

Isinglass as Transfusion Fluid in Hemorrhage. N. B. Taylor and E. T. Waters, Toronto.—p. 547.
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Phantom Limb.—According to Bailey and Moersch, "phantom limb" occurs in most cases of upper and lower limb amputation, but only a small number of persons presenting the syndrome are actually incapacitated in any way. Pain, however, may lead occasionally to drug addiction or suicide. The authors' observations are based on the clinical study of 105 patients, 55 of whom (group 1) sought relief of pain at the Mayo Clinic; 50 (group 2) had their amputations at this clinic and were followed up. In both of these groups there were only 17 female subjects. Total phantom limb incidence amounted to 90.5 per cent; the lower limb syndrome occurred more frequently (57 cases) than the upper limb (48 cases). The most common causes of amputation were traumas (56) and vascular diseases (28). In group 1 the syndrome had occurred in 42 immediately after the amputation; in the remaining 13, between less than one month to more than one year, mostly within five years. In many cases the lost limb sensation had been felt intermittently from twelve to twenty-nine years before distressing symptoms occurred. In the majority of cases the average time since the operation was less than five years, illustrating how rapidly pain becomes a real problem. Pain is usually described as of a burning, aching or cramping nature; many patients variously described it as a crushing, twisting,

grinding, tingling, tearing or drawing sensation. In most cases the stump was the site of some distress. Aggravation due to climatic changes is not regarded as of particular significance. Fifteen different types of treatment had been employed, either at the clinic or before the patients came to the clinic, but gave only temporary relief. In most cases the treatment was mainly, if not exclusively, surgical: 15 were operated on once, 28 once or oftener, and 15 were treated conservatively. Some aspects of the phantom limb problem defy explanation on the basis of any single theory. The syndrome seems to be of a central (intracranial) origin, most probably psychic, and may constitute a form of obsession neurosis. General measures of a psychotherapeutic nature should be instituted immediately after the operation. The clinical entity of phantom limb cannot be doubted. The treatment is still unsatisfactory.

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*Specific Chemotherapy of Giardia Infections. J. T. Culbertson, New York.—p. 1465.
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*Studies in Blood Preservation: Fate of Cellular Elements and Prothrombin in Citrated Blood. C. R. Drew and J. Scudder, New York.—p. 1473.
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Studies in Dystrophia Myotonica: VI. Results of Glucose Tolerance Tests. M. R. Rymer and A. Ravin, Denver.—p. 1506.

Chemotherapy of Giardia Infections.—Culbertson's first patient was a woman of 25 whose infection had been first diagnosed six years earlier. At irregular intervals thereafter parasites or cysts were found in her stools. An ineffectual attempt was made in 1936 to eliminate the parasites by administering carbarsone. Thereafter cysts were believed reduced in number for a time, but they never disappeared entirely and after treatment was discontinued they again became numerous. Many cysts were observed in January 1940, one day prior to treatment with atabrine. Atabrine treatment consisted of two 0.1 Gm. tablets daily for five days. A stool specimen obtained two days after the last day of treatment was negative for cysts and trophozoites of Giardia lamblia. Stools obtained one, two, four and six weeks later were likewise negative. No pigmentation of the skin was observed at any time. The second patient, a man, was also treated successfully with atabrine. A stool examined just prior to treatment contained many cysts of Giardia lamblia. Two 0.1 Gm. tablets of atabrine were given daily for five days. Examination of stools obtained on three successive days after the last day of treatment revealed neither cysts nor trophozoites. Neither atabrine nor acriflavine in the doses given was effective in eliminating infections with Trichomonas muris, Trichomonas parva, Chilomastix bettencourti, Hexamita muris or Endomoeba muris from the albino rat.

Blood Preservation.—Drew and Scudder present the following changes as typical of a large number of observations on citrated blood: 1. In citrated blood there is some loss in the number of erythrocytes beginning about the fifteenth day and amounting to from one to one and a half million cells by the end of the month. 2. The hemoglobin content remains constant in the total sample, although from 15 to 25 per cent may diffuse out of the cells into the plasma in one month. 3. The polymorphonuclear leukocytes are diminished to 50 per cent in forty-eight hours and are amorphous masses in fifteen days. 4. The lymphocytes and eosinophils do not disintegrate so rapidly; the latter are particularly well preserved. The monocytes are difficult to trace. 5. The platelets fall rapidly to a level ranging from 50,000 to 80,000 and remain at this level for about fifteen days and then become difficult to count. 6. The fragility of red blood cells slowly increases with increasing age; exact curves are difficult to establish. 7. The prothrombin level is maintained above 40 per cent of normal concentration for at least four months. The use of old brain extract will cause clotting times that are too rapid, giving a false picture of the true degree of efficacy of preserved blood in the therapy of hemorrhagic diseases associated with low prothrombin concentrations.

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*Toxic Reactions with Gold Salts in Treatment of Rheumatoid Arthritis. R. M. Lintz, New York.—p. 1629.

Chrysotherapy in Rheumatoid Arthritis.—According to Lintz, gold salt therapy in rheumatoid arthritis is attended with certain risks. The first manifestations of toxic reaction may consist in exacerbations of articular symptoms, in lesions of the skin, mouth, gastrointestinal tract, liver, kidneys, vasomotor apparatus or of the hemopoietic system. Reactions may appear any time between the time of the first injection and several months later. Fatalities have been reported after exfoliative dermatitis, acute yellow atrophy of the liver and blood dyscrasias. Suggested methods of preventing or controlling reactions have not proved successful. Chrysotherapy is contraindicated for patients with hepatic or renal involvement or those of the hemopoietic system. Treatment should be discontinued at the first sign of any toxic reaction and may be resumed when the signs have cleared, except in cases in which exfoliative dermatitis, blood dyscrasias or severe hepatic and renal lesions exist.

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Equine Encephalomyelitis.—From an analysis of 34 certain cases of equine encephalomyelitis due to the eastern variety of virus that occurred in southeastern Massachusetts during an epidemic of the disease in horses, Getting observed permanent sequelae (mental retardation, hemiparesis, aphasia and emotional instability) in 6 of the 9 surviving patients. Approximately 70 per cent of the cases were among infants and children less than 10 years of age. The 9 surviving patients, in whose blood neutralizing antibodies to the virus were found, were seen at varying intervals from the date of the original illness. It is impossible to prognosticate the eventual course of the residual sequelae. It seems that they are permanent and may even be progressive. As soon as the true nature of the equine encephalomyelitis outbreak was realized, a mosquito survey was undertaken. In all, fifty-six different species of mosquitoes were collected and of them thirty-seven were of the biting and the remainder of the nonbiting kind. Only six of the biting species have been shown experimentally to transmit the eastern virus of equine encephalomyelitis to laboratory animals. There were three salt marsh species—Aedes cantator, Aedes sollicitans and Aedes taeniorhynchus—and three fresh water species—Aedes atropalpus, Aedes triseriatus and Aedes vexans. The former are usually limited to within 10 miles of salt water. Two of the fresh water vectors, Aedes triseriatus and Aedes vexans, were statewide, the latter being from five to fifteen times as prevalent as the former. Aedes vexans is probably the most important vector of equine encephalomyelitis in Massachusetts. The epidemiologic and entomologic data support the laboratory evidence that equine encephalomyelitis is transmitted by mosquitoes, since the geographic distribution and the seasonal prevalence of the disease and the vectors have been found to be the same. The biting habits of the vectors suggest that the hazard of outdoor exposure of man and animals to the mosquitoes is ten times as great as it is of those in buildings. Thus the high incidence among the young may be explained, as during the summer infants and children often sleep outdoors, sometimes without protective netting. Moreover, children less than 10 years of age who play outdoors the greater part of the day are less efficient than older groups in protecting themselves against mosquitoes, since they do not react to the buzzing and alighting of a mosquito but only when bitten. Of the mosquitoes captured on man outdoors 60 per cent were vectors, as compared to only 6 per cent of those caught indoors.

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Congenital Nevi, Cancer and Melanoma.—Traub recommends the following classification for nevi: (1) vascular nevi, which may be subdivided into flat, raised or deep nevus vasculosus, nevus lymphangiectodes, nevus vasculosus and lymphangiectodes, and heterogeneous vascular nevus; (2) pigmented, hairy and/or warty nevi which consist of intraepidermal nevus, epidermodermal nevus (junction type nevus), which may terminate in melanoma (nevocarcinoma), intradermal nevus, which is always benign if of the pure type, blue nevus and the heterogeneous pigmented nevus or combination of two or more of the foregoing types, and (3) nevi of special tissue, that is, glandular, connective tissue nevus, fat tissue nevus—nevus lipomatodes, nerve nevus and the heterogeneous nevus. Most of the pigmented nevi fit readily into one of the first four subgroups. A few present difficulty in cataloguing, and a small number of mixed or combination types occur. The epidermodermal nevus is the forerunner of the melanoma. In the past, melanomas that were thought to have arisen from normal skin in all probability arose from a junction nevus that had suddenly appeared. For this reason, junction nevi that appear later in life should receive particular attention. Their prophylactic removal is advised, particularly when they appear suddenly in later life, when they occur in areas subject to trauma, when the lesions are borderline and when frequent observation is not possible. Because of the short interval between the time the patient or physician notices usual signs and symptoms (change in color, bleeding, ulceration, increased growth and the like), regarded as "early," and metastasis these criteria must in reality be put down as late signs. Most nevi apparently remain true to type as far as the author's microscopic studies of 400 specimens reveal. The changes that occur in their clinical appearance are either developmental or degenerative and do not indicate that an intradermal nevus is changing to a junction type. Any and every type of combination of mixed types of nevi is possible. All nevi, including the junction type, may be safely removed without wide excisions. When melanoma or squamous cell carcinoma is suspected or proved, radical removal and, if indicated, node dissection of the drainage area should be prompt. Biopsies, if followed immediately by the indicated treatment, may obviate unnecessary radical procedures. The clinical course of the lesion is important and serves to control errors in diagnosis from single cutaneous sections which may be confusing and at times difficult to interpret microscopically. The wounds of extensive excisions with the electric cutting current heal without grafting of skin.

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Critical Analysis of Series of Appendectomized Patients. Z. Sagal and W. Heinemann, New York.—p. 204.
Carcinoma of Tongue with Metastases to Lungs: Report of Two Cases. D. E. Ehrlich and S. D. Blum, New York.—p. 211.
New Proctosigmoidoscope: Review of the American Contribution to Development of These Instruments. M. Einhorn, New York.—p 218.
Acute Sigmoidorectal Intussusception: Report of Case in Infant, Reduced in Course of Proctosigmoidoscopy. I. Skir, Brooklyn.—p. 232.
Carcinoma of Cardia: Case Report. A. Bernstein, Chicago.—p. 234.
Perforation of Carcinoma of Stomach. C. Haines, New Rochelle, N. Y.—p. 239.
New Gastroduodenal Tube. A. J. Cantor, Flushing, N. Y.—p. 241.
Biliary Tract Surgery: Results in 215 Consecutive Cases from the Louisiana State University Surgical Service of the Charity Hospital at New Orleans. U. Maes and S. A. Romano, New Orleans.—p. 245.
Biliary System: Liver, Gallbladder and Jaundice, Biblical and Talmudic Data. C. J. Brim, New York.—p. 255.

Rhode Island Medical Journal, Providence

24:75-102 (May) 1941

Varicose Veins and Related Conditions: I. Modern Treatment of Varicose Veins. S. J. Goldowsky, Providence.—p. 75.
Id.: II. Ulcers, Phlebitis and Thromboses. J. B. Sears, Boston.—p. 79.
Bakelite Brains. M. Korb and C. A. McDonald, Providence.—p. 82.
Tularemia: Report of Case Contracted from Infected Rabbit; Treated with Sulfanilamide. A. W. Eckstein, Providence.—p. 84.

24:103-122 (June) 1941

A Generation of Surgery. L. C. Kingman, Providence.—p. 103.
Tetanus. H. E. Utter, Providence.—p. 107.
Immunization Against Scarlet Fever. W. P. Buffum, Providence.—p. 109.
Whooping Cough. B. Feinberg, Providence.—p. 109.

Southwestern Medicine, El Paso, Texas

25:133-164 (May) 1941

Low Back Pain: Relation to Organic Neurologic Causes. R. B. Raney, Hollywood, Calif.—p. 133.
Craniocerebral Injury. J. R. Jaeger, Denver.—p. 138.
Treatment of Acute Respiratory Infections with Oral Coryza Antigen: Preliminary Report. M. R. Palmer and J. E. Andes, Tucson, Ariz.—p. 144.
Leiboff Test: Comparison with Hinton, Kahn, Kline and Mazzini Tests. R. A. Greene and E. L. Breazeale, Tucson, Ariz.—p. 148.
Tests for Serum Sensitivity. J. D. LeMar, Omaha.—p. 149.

25:165-196 (June) 1941

Tuberculosis in the Spanish Population of New Mexico. C. Mulky, Albuquerque, N. M.—p. 165.
Some Pulmonary Problems Related to Anesthesia. L. H. Mousel and J. S. Lundy, Rochester, Minn.—p. 166.
*Spider Bite: Specific Treatment of That Caused by Black Widow. Z. B. Noon, Nogales, Ariz., and W. L. Minear, Patagonia, Ariz.—p. 169.
Industrial Surgery Practice in Arizona. E. C. Houle, Nogales, Ariz.—p. 176.
Herpes of Bladder, Without Accompanying Cutaneous Lesions. J. R. Rinker, Fort Worth, Texas.—p. 180.

Spider Bite.—Noon and Minear used specific antivenin (Latrodectus mactans) for the treatment of 6 cases of arachnoidism. The series is small for definite conclusions, but certain points are obvious. The greatly reduced morbidity of patients treated with antivenin is obvious when compared to those receiving nonspecific therapy. In 1 of their patients receiving both nonspecific and specific treatment, they feel that the tremendous reduction of morbidity was due to the antivenin. It has been their experience that when antivenin is given before symptoms are severe and definitely established the morbidity is practically nil. When the symptoms are severe and several hours have elapsed before antivenin therapy is instituted, the final curative effect is delayed in proportion to the time of the spider bite and the severity of symptoms at the time of treatment. It seems possible that more prompt relief would result by giving twice the usual dose of antivenin in the severe cases when much time has elapsed after the bite and the institution of treatment. In 2 of the authors' patients treated with antivenin a delayed serum reaction, hives, developed. Their duration was forty-eight hours. They believe that antivenin therapy should also prove of value in reducing the mortality, especially in the very young and the very old patients.

Surgery, Gynecology and Obstetrics, Chicago

72:951-1096 (June) 1941

Synovial Sarcomas in Joints, Bursas and Tendon Sheaths: Clinical and Pathologic Study of Sixteen Cases. D. A. De Santo, R. Tennant and P. D. Rosahn, New York.—p. 951.
Bacterial Flora of Acute Traumatic Wounds. E. J. Pulaski, F. L. Meleney, New York, and W. L. C. Spaeth, Philadelphia.—p. 982.
Sulfathiazole and Sodium Sulfathiazole in Treatment of Postoperative Pneumonia. W. W. Spink and C. J. Bellis, Minneapolis.—p. 989.
Sulfone Chemotherapy in Hematogenous Osteomyelitis. E. Bick, New York.—p. 995.
Experimental Collateral Circulation of Heart. K. Friedbacher, West Allis, Wis.—p. 1003.
*Pericardiectomy for Chronic Constrictive Pericarditis. W. H. Cole, R. D. Weber and R. W. Keeton, Chicago.—p. 1008.
*Extensive Cutaneous Burns, with Special Reference to Blood Chemical Changes. R. M. Tenery, New York.—p. 1018.
*Postoperative Infection: Measures of Control. G. de Takats and J. H. Jesser, Chicago.—p. 1028.
*Unruptured Primary Ovarian Pregnancy. A. H. Curtis, Chicago.—p. 1039.
Disruption of Abdominal Wounds: Continuation of Previous Report. F. Glenn and S. W. Moore, New York.—p. 1041.
Fractures of Mandible. M. S. Strock, Boston.—p. 1047.
Prevention of Wound Disruption with Through and Through Silver Wire Stay Sutures. C. W. Holman and J. H. Eckel, New York.—p. 1052.
Use of Alloy Steel Wire in Closure of Abdominal Wounds. T. E. Jones, E. T. Newell Jr. and R. E. Brubaker, Cleveland.—p. 1056.
Acute and Chronic Intra-Abdominal Lymphadenopathy. A. O. Wilensky, New York.—p. 1060.

Pericardiectomy for Pericarditis.—In view of the hopelessness of the conservative treatment of pericarditis, Cole and his associates advise that the operation of pericardiectomy be performed before myocardial damage due to compression becomes irreparable. Although the operative mortality is high, the results are otherwise excellent, especially in young people; few patients in late adult life survive the operation. The results may not be immediate. In 1 of their patients strength was still subnormal one year after operation, but two years after the operation he felt normal and was working daily as a pressman. The modern operation is to remove the constricting fibrous tissue. Local anesthesia may be used, though a general anesthetic is preferable. Most authors are in favor of removing the left half of the sternum to facilitate exposure. The reflection of the left pleura is located and dissected outward along with adjacent tissue to allow exposure of the heart. As soon as the heart is exposed, attempt should be made to identify the descending branch of the left coronary artery and the auriculoventricular groove. It is not necessary to remove the scar from the auricles or the great vessels unless the scar is more pronounced here than elsewhere. The essential features consist of removal of the scar from the ventricles and from the apex. The excision of the scar over the ventricles should be started on the left side because of the danger of dilatation of the right ventricle if excision is started on the right side. Areas of calcification should be removed only if this can be done safely. If the rhythm of the heart is disturbed, all manipulation should be terminated until it is again normal. During excision of the scar a flap of fibrous tissue should be left attached to the heart so that it might be inserted firmly against any bleeding point. Removal of the scar should be as complete as possible, but it should not extend beyond the limits of good exposure. If the pleural cavity is entered, the hole should be obliterated immediately and a suture taken to close it. The dead space created by excision of the ribs is sealed up as well as possible with the pectoral and intercostal muscles. A small rubber drain should be left in the inferior or superior part of the wound to prevent accumulation of fluid. Oxygen therapy is one of the most important considerations in postoperative care. Elevation of the head of the bed will add to the patient's comfort. Intravenous fluids should be given with caution because of the severe, sudden strain thrown on the heart incident to the operative procedure. A small transfusion in addition to from 500 to 700 cc. of dextrose given slowly is safe and advisable. Digitalis may be used for fibrillation but not for tachycardia alone. Fluid and foods are given as tolerated.

Blood Chemical Changes in Cutaneous Burns.—Tenery evaluates the role of blood electrolyte changes, especially potassium, in the production of the toxic stage in 8 severely burned patients. Blood pressures could not be determined, as both upper extremities were burned. Two patients showed no definite toxic symptoms, 3 showed moderate reactions but at no time were in shock (these 5 patients recovered) and unquestionable, severe symptoms of the toxic stage were present from the second twenty hours after the burn until death of the 3 remaining patients. The hemocrit rose in all the patients, but in only 2 did it reach a high level before adequate therapy brought about dilution. About one half of the hemoconcentration that was to occur was present six hours after the burn, indicating the need for early plasma transfusion. Observations on plasma protein indicate the need for conservatism in the use of parenteral saline solution and show a definite advantage in the use of plasma for preventing and relieving hemoconcentration. Increases in plasma potassium did not occur in the first forty-eight hours except in 1 patient whose burns were the slightest; in no instance did the potassium reach a toxic level. It is probable that elevations would have been greater had the patients not received treatment, but the important point is that toxic symptoms were present without a toxic plasma potassium level. Generally a decrease occurred during the first forty-eight hours and was then followed by a rise. Estimations of the cell hemoglobin content indicate that part of this decrease is the result of intracellular dilution; this may further confirm the concept that the erythrocytes become swollen in shock. In spite of the relatively large amounts of parenteral saline solution, plasma chlorides decreased slowly, though in no instance did they reach a dangerous level. In contrast, the sodium level fell to a much greater degree.

Plasma sodium of 3 patients dropped below 130 milliequivalents per liter. This could be a manifestation of adrenal insufficiency in spite of the normal plasma potassium. One of these patients was given eschatin and a rise in plasma sodium and chloride followed, but the patient remained in circulatory failure and died. In 1 patient a definite burn toxemia was present without lowered plasma sodium and in the others there was no relationship between the plasma sodium level and toxic symptoms.

Control of Postoperative Infection.—De Takats and Jesser discuss the sources of contamination in the surgical field. Data on 606 clean operations during which the sources of contamination were studied shows that 501 of the wounds healed by primary union, leaving 17.35 per cent with some disturbance in wound healing. Reddened cutaneous edges (even the slightest were recorded) were the most frequent complication. They are obviously due to contamination from the skin at the time of operation or possibly during healing. Postoperative infection resulting in prolongation of hospital stay or danger to life occurred in 1.59 per cent of the cases. In 143 herniotomies, the edges of 10.4 per cent were reddened and a hematoma was present in 3.7 per cent. This emphasizes the importance of adequate preparation of the pubic skin, careful hemostasis and the possibility of postoperative contamination. Among the 26 thyroidectomies, reddening of the skin and hematoma were also the two complications listed. Of the 45 hysterectomies, 23 per cent showed reddened cutaneous edges. This service has since cut down this percentage to a small minimum. Among the 28 cholecystectomies the wounds of 3.6 per cent presented reddened skin edges. In a miscellaneous group (105 cases) including neurosurgical cases and vascular surgery, plastic surgery, thoracic and genitourinary patients, primary wound healing (82.7 per cent) compared favorably with most other groups; the wound edges of 9.7 per cent were reddened. Appendectomies did equally well with the exception of minor cutaneous infections (6.56 per cent). The statistics on bone and tendon operations are favorable especially with regard to the low incidence of minor cutaneous infections (2.4 per cent) and of hematoma (3.8 per cent). Following mastectomies, necrosis of the skin edges was encountered in 20.83 per cent. This is obviously due to the effort of removing as much skin as possible or saving too much undermined skin and may point to a more frequent use of immediate or delayed skin grafts. Other laparotomies behaved much like the average group. The incidence of stitch abscesses, slight and serious wound infections, infected hematomas and septicemia totals 3.81 per cent of all clean operations. The reddened skin edges are undoubtedly due to inadequate sterilization of the skin or postoperative contamination of the wound. In addition to the soap and water, iodine and alcohol preparation, the authors advocate the use of silverfoil, under which they have never seen a true cutaneous infection, and the gluing of the gauze dressing to the skin with mastisol (40 Gm. of gum mastic and 100 Gm. of benzene filtered to which is added 20 minims [1.25 cc.] of castor oil). The importance of late cutaneous infections is best seen in ambulatory vein ligations. These patients require added protection of the suture line from cutaneous bacteria. The authors describe the use of a new flannel mask which efficiently filters bacteria but does not deflect them.

Ruptured Primary Ovarian Pregnancy.—Curtis reports an instance of a living unruptured primary ovarian pregnancy in which the fallopian tube was in no way attached to the ovary except that there was a trough from the fallopian tube to the ovary created by an unusually developed fimbria ovarica. Operation the next morning revealed a retrodisplaced edematous uterus one and one half times its normal size. The left ovary occupied a relatively normal position, independent of the tube and was converted into a hemorrhagic cyst the size, shape and color of a large, freshly washed, deep red medium sized peach. The freshly removed hemorrhagic fluctuant ovarian mass measured 5.5 by 3.5 by 6 cm. Hemisection after fixation in Kaiserling solution revealed an intact wall which varied from 0.5 to 2 cm. in thickness. The cut surface was reddish brown except for a 2 to 4 mm. shell of grayish white, normal appearing ovarian tissue which encased two thirds of the circumference of the solid wall, within which was a central cavity. No corpus luteum was evident. The spherical cavity, filled with clear liquid, was lined by a smooth glistening membrane; its diameter measured 2.5 cm. An intact curled fetus, 12 mm. in length, was supported by filmy membranes and a clearly distinguishable body stalk attached near the caudal end. Microscopic study of the wall revealed typical chorionic villi with well preserved syncytial and Langhans cells. Primary ovarian pregnancy is probably not rare. It may explain many serious hemorrhages from the ovary; it may account for some instances of secondary abdominal pregnancy—a much more common condition than has heretofore been realized.

Tennessee State Medical Assn. Journal, Nashville

34:205-248 (June) 1941

Tuberculosis Control Program in Tennessee. R. S. Gass, Franklin, and W. W. Hubbard, Nashville.—p. 205.
Tumors of Breast. C. L. Chumley, Knoxville.—p. 210.
Sulfathiazole in Treatment of Otitis Media: Report on Thirty-Two Cases. F. L. Alloway, Kingsport.—p. 217.
Treatment of X-Ray and Radium Burns by Radical Excision and Grafting. B. Douglas, Nashville.—p. 220.
Diagnosis and Management of Goiters. C. E. Newell, Chattanooga.—p. 225.
Present Day Methods in Treating Urinary Tract Infections. B. W. Wright, Nashville.—p. 231.

Virginia Medical Monthly, Richmond

68:375-436 (July) 1941

Endocrine Therapy of Ovarian Failure. E. C. Hamblen and R. L. Pullen, Durham, N. C.—p. 375.
Assay of Urinary Gonadotropin in Cases of Testicular Tumor. R. J. Main, Richmond.—p. 381.
Ignorance and Medicine. A. D. Hart Jr., University.—p. 384.
Hemorrhage in Labor. C. J. Andrews, Norfolk.—p. 390.
Cystic Lung Disease: Report of Two Cases with Autopsy Findings. W. L. Nalls and D. B. Cole, Richmond.—p. 394.
Independent Occurrence of Multiple Pulmonary Abscesses: Report of Case. G. B. Craddock, Lynchburg, W. E. Pembleton and P. P. Vinson, Richmond.—p. 398.
Ocular Tuberculosis: Review and Report of Four Cases. H. G. Preston, Harrisonburg.—p. 400.
Torula Histolytica (Blastomycoides Histolytica) Meningitis: Report of Case with Recovery. E. C. Toone Jr., Richmond.—p. 405.
Verumontanitis. F. Helvestine Jr., Roanoke.—p. 407.
Use of Sulfapyridine and Sulfathiazole in General Practice. W. B. McIlwaine, Petersburg.—p. 409.
In Defense of Bad Temper. J. S. Horsley, Richmond.—p. 411.

Western J. Surg., Obst. & Gynecology, Portland, Ore.

49:309-364 (June) 1941

Diagnosis and Treatment of Anterior Pituitary Disturbances. M. G. Wohl, Philadelphia.—p. 309.
Gynecologic and Obstetric Endocrinology. J. P. Greenhill and S. C. Freed, Chicago.—p. 318.
Ruptured Graafian Follicle and Corpus Luteum Cysts with Intraperitoneal Hemorrhage. T. R. Hofmann, Berkeley, Calif.—p. 331.
Pyelonephritis Incident to Pregnancy. A. H. Peacock, Seattle.—p. 340.
Neurogenic Theory Concerning Effects of Iodine on Goiter. S. Brock, Chicago.—p. 344.
Implications of Weight Gain During Pregnancy. G. S. Beardsley, Eugene, Ore.—p. 350.
Testosterone in Treatment of Prostatism and Benign Prostatic Hypertrophy. E. L. Touriel, Los Angeles.—p. 354.
Extensive Generalized Thrombophlebitis Following Eclampsia and Cesarean Section: Recovery with Heparin Therapy. E. W. Boland and H. M. Rooney, Los Angeles.—p. 356.

Wisconsin Medical Journal, Madison

40:461-552 (June) 1941

*Occult Hypothyroidism in Wisconsin Women. A. M. Schwittay, Madison.—p. 475.
Pelvic Bone Metastases, from Carcinoma of Breast, Treated with Roentgen Therapy: Case Report. L. V. Littig, Madison.—p. 479.
Management of Patients with Renal Lithiasis. C. C. Higgins, Cleveland.—p. 480.
Bow Leg. W. P. Blount, Milwaukee.—p. 484.
Surgical Treatment of Otosclerosis. G. E. Shambaugh Jr., Chicago.—p. 488.
Common Pitfalls in Diagnosis. F. J. Hirschboeck, Duluth, Minn.—p. 493.

Occult Hypothyroidism in Wisconsin Women.—Schwittay suggests that the present interpretation of basal metabolic rates be revised; otherwise many patients who could benefit from thyroid therapy will be missed. He made the therapeutic test of thyroid medication and found that the results were often as good when the basal rate was —8 or —10 as when it was —25 or —30. Good results were obtained in such women with all types of menstrual disorders.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

1:805-840 (May 31) 1940

Da Costa's Syndrome (or Effort Syndrome): Mechanism of Somatic Manifestations. P. Wood.—p. 805.
Rapid Identification of Clostridium Welchii by Nagler Reaction. Nancy J. Hayward.—p. 811.
After-Treatment of Paraplegic Patients Following Injuries to Spine. E. L. Gowlland.—p. 814.
Intravenous Anesthesia in Obstetrics. K. M. Robertson.—p. 815.
Effect of Benzedrine of Oculogyric Crises of Parkinsonism. H. L. Hoffman.—p. 816.

1:841-876 (June 7) 1941

Calculation and Prescribing of Infants' Feeds: I. After Neonatal Period; Use of Standard Mixtures. Helen M. M. MacKay.—p. 841.
Etiology of Da Costa's Syndrome. P. Wood.—p. 845.
Syphilitic Thoracic Aneurysm in Young Adults. B. Evans.—p. 851.
Note on Testing of Transfusion Fluids for Contamination. W. R. Logan.—p. 854.

Indian Medical Gazette, Calcutta

76:193-256 (April) 1941

Fracture of Carpal Scaphoid. C. J. Hassett.—p. 193.
Surgical Complications of Filariasis. P. N. Ray.—p. 194.
'Xiphisternal Ache' or Low Substernal Pain. R. J. Vakil.—p. 199.
Report on Use of Cadmium Sulfide in Treatment of Pulmonary Tuberculosis at Jadabpur Tuberculosis Hospital. K. S. Ray, N. N. Sen and H. N. Das Gupta.—p. 203.
Reduction of Benedict's Solution by Urine During Course of Sulfathiazole Therapy. R. E. Strain.—p. 206.
Urinary Excretion of Nicotinic Acid in Pellagrins. B. Naganna, K. V. Giri and P. Venkatesam.—p. 208.
Use of Cassia Fistula in Treatment of Blackwater Fever. K. Venkatachalam and A. N. Ratnagiriswaran.—p. 211.
Search for Latent Sylvatic Plague in Calcutta. C. L. Pasricha and G. Panja.—p. 212.
Erythrocyte Sedimentation Rate in Cholera. A. J. H. deMonte and S. K. Gupta.—p. 213.
Sterility and Potency of Injectable Substances: II. Salines for Intravenous Use. C. L. Pasricha, K. S. Malik and B. M. Paul.—p. 216.
Further Type of Choleraphage—Type N. C. L. Pasricha, M. N. Lahiri and A. J. H. deMonte.—p. 218.
Insectary Colony of Anopheles Stephensi Mysorensis. P. F. Russell and B. N. Mohan.—p. 219.
Hematologic Technic: Part X. L. E. Napier and C. R. Das Gupta.—p. 229.
Lecture on Coordinated Effect in Hygiene. W. H. Crichton.—p. 240.
Water in Relation to Health. T. N. S. Raghavachari.—p. 233.

Journal of Royal Army Medical Corps, London

76:249-310 (May) 1941

*Analysis of 204 Cases of Cerebrospinal Fever Among British Troops of the British Expeditionary Force in France. R. Priest.—p. 249.
Reorganization of Field Ambulance. H. L. G. Hughes.—p. 261.
Phthisis Following Pleurisy. W. Laurie.—p. 270.
Treatment of Soldier's Foot. A. J. Helfet.—p. 282.

Cerebrospinal Fever Among British Troops in France.—Priest states that 204 cases of cerebrospinal fever occurred between February 1940 and June 14, 1940 in the British Expeditionary Force in France. The diagnosis of 171 was proved bacteriologically, and the symptoms, physical signs, clinical course and the general characteristics of the cerebrospinal fluid in the other 33 were typical. At no time was the infection epidemic. In fact, its sporadicity was a particularly conspicuous feature. The onset was varied and deceptive. It was of three types: severe fulminating with rapid loss of consciousness and late meningeal signs, the more usual acute onset with immediate signs of meningitis and the type with chronic meningococcic bacteremia. The onset of 56 was sudden. The illness in 12 followed some form of exercise or exertion. Rigors, headache, vomiting and nuchal stiffness were the most frequent symptoms in all stages of the disease. Vomiting was sometimes troublesome and persistent. It was absent throughout the illness in 17. A few patients did not vomit until treatment with sulfapyridine was begun. Pain and stiffness in the neck and headache were steadily progressive. Photophobia was a fairly common symptom late in the disease. At first some patients were treated with sulfapyridine and antimeningococcus serum, but experience showed that the response to chemotherapy alone of patients suffering from the severe and fulminating forms of the disease was excellent and rapid. Thereafter serum was discontinued. In fact, the serum sickness of a few patients proved to be a "nuisance value" and a check to an otherwise uneventful convalescence. The maximal dose of sulfapyridine was 81 Gm. in ten days and the minimal dose was 14.5 Gm. in six days. The average dose per patient was 34.4 Gm. administered during seven and nine-tenths days. Cyanosis was a frequently observed feature during therapy, but it was never of sufficient intensity to discontinue treatment. The rapid amelioration of the patients' general condition was short of miraculous. The comparative absence of permanent disability was another welcome feature. From a military aspect the sulfanilamide and its derivatives have proved of inestimable value in that once a patient is under the influence of the drug he can be moved from a forward unit to one farther back by ambulance or train, or overseas, without detriment to recovery. Chemotherapy permits the sending of convalescents to a convalescent depot instead of on sick leave. Of 50 men sent to a convalescent depot in France, 46 were examined at intervals and only 3 claimed annoying headaches; 1 or 2 complained of pain at the site of lumbar puncture but, aided by the example of the others, they got well and went back to duty. There were 2 deaths but neither was due to the effects of meningococci; 1 patient died six weeks after onset from an ascending infection following repeated catheterization, and 1 died from bronchopneumonia and pericarditis with effusion and adhesions not of meningococcic origin.

Lancet, London

1:685-712 (May 31) 1941

*Quantitative Aspects of Transfusion. G. A. Harrison and L. E. R. Picken.—p. 685.
Civilian Psychiatric Air Raid Casualties. F. Brown.—p. 686.
*Absorption and Excretion of Sulfonamides Applied Locally: Observations in Rabbits. L. G. Goodwin and G. M. Findlay.—p. 691.
Thoracoplasty for Pulmonary Tuberculosis. J. V. Hurford.—p. 693.

1:713-744 (June 7) 1941

Casualties from Western Descrt and Libya Arriving at a Base Hospital. G. A. G. Mitchell, N. J. Logie and R. S. Handley.—p. 713.
Reduction of Dust-Borne Infection by Treatment of Bedclothes. M. van den Ende, D. G. f. Edward and Dora Lush.—p. 716.
Abdominal Aneurysm: Four Cases. G. H. Jennings.—p. 719.
Preservation of Organic Phosphorus Compounds in Stored Blood by Glucose. M. Maizels.—p. 722.
Estimation of Prothrombin. T. K. Owen and M. Toohey.—p. 724.

Quantitative Aspects of Transfusion.—Harrison and Picken state that the object of transfusion in hemorrhage and circulatory shock is to restore a balance and not to stimulate impaired function. To determine the amount to be transfused it is necessary to consider the dissolved protein content of the medium and the blood volume of the subject in health and at the time of the transfusion. For each stone (14 pounds, or 6.4 Kg.) of body weight there is in health approximately 1 pint (500 cc.) of blood. The proportion of corpuscles in the blood varies between 36 and 51 per cent by volume. During hemorrhage the volumes of erythrocytes and plasma are reduced, but it is the fall in the volume of plasma which produces the immediate signs and symptoms of circulatory or "secondary" shock. The water and salts of plasma are easily replaced but in the absence of its protein their contribution to the circulation is short lived as they leave the circulation rapidly. Only serum, plasma or whole blood can replace proteins. An acute hemorrhage would be extremely severe if the patient lost 3 pints of cells and 3 pints of plasma. To replace such a loss 3.4 pints of filtered serum, 5.1 pints of citrated plasma, 8 pints of citrated whole blood and 6.6 pints of defibrinated whole blood would be required. These are maximal amounts; they should rarely, if ever, be exceeded. Few patients will need more than 2 pints of serum or plasma initially. After the initial treatment for shock, whole blood should be used for the subsequent treatment of anemia, the volume being estimated from hemoglobin determinations. In wound shock without significant hemorrhage 1 or, at most, 2 pints of serum or their equivalent of plasma should be given. In severe secondary shock 1 pint in excess of the amount required to replace lost plasma may endanger life because of the resultant pulmonary edema. In primary shock only, with no evidence of loss of cells or plasma by internal hemorrhage or edema, there is no rational basis for transfusion therapy.

Absorption and Excretion of Locally Applied Sulfonamides.—Goodwin and Findlay determined the rate of absorption, conjugation and excretion of sulfanilamide, sulfapyridine and sulfathiazole after their local application to uninfected wounds in rabbits. The drugs were finely powdered and the dosage employed was based on that recommended for local application in gas gangrene, from 5 to 15 Gm. of powdered drug for an adult. For sulfanilamide a maximal blood concentration of from 1 to 5 mg. of free sulfanilamide per hundred cubic centimeters was attained about five hours after application. Thereafter the concentration fell rapidly and, if a level of about 2 mg. was to be maintained, oral administration had to be started six hours after local application. About 50 per cent of the dose applied was excreted in twenty-four hours. About 90 per cent of the excreted drug was in the conjugated form. The level of free sulfapyridine was extremely low, and all trace of it disappeared within twenty-four hours. The concentration of "total" drug reached to about 0.5 mg. per hundred cubic centimeters in from three to four hours and then decreased gradually. Excretion was slower than with sulfanilamide, about 7 per cent being eliminated in twenty-four hours. From 70 to 80 per cent of the excreted drug was conjugated. The maximal concentration of about 0.75 mg. per hundred cubic centimeters of free sulfathiazole was reached in five hours, and the subsequent decrease was less rapid than with sulfanilamide. About 18 per cent of it was excreted in twenty-four hours and about 75 per cent of this was in the conjugated form. The rate of absorption of the three drugs from wounds in the skin and thigh muscles differed but little. The experiments involved clean, uninfected wounds; grossly infected wounds might modify absorption.

Medical Journal of Australia, Sydney

1:662-692 (May 31) 1941

*Studies in Tuberculosis. R. Webster.—p. 662.
Method of Dealing with Fractures Through Infraorbital Margin. T. B. Law.—p. 666.
Treatment of "the Effort Syndrome." A. G. Butler.—p. 667.
Suicide and Its Prevention. E. H. Derrick.—p. 668.
Infertile Marriage or Sterility. A. Grant.—p. 672.

1:693-716 (June 7) 1941

Some Observations on Myocardial Infarction. T. E. Lowe.—p. 693.
Effect of Estrogenic Substances on Kidney of Trichosurus Vulpecula. A. Bolliger and A. J. Canny.—p. 697.
Vesical Exclusion. K. Kirkland.—p. 699.

Tuberculosis.—Experience gained from the cultivation of 370 strains of Mycobacterium tuberculosis from 928 diverse samples of pathologic tissues and exudates has convinced Webster of the validity of the claim that cultural methods are at least as effective as that of guinea pig inoculation. He believes that direct cultivation of Mycobacterium tuberculosis should be a matter of routine in all health, hospital and sanatorium laboratories. The technical methods involved do not require elaborate equipment. Mycobacterium tuberculosis should receive the same treatment as diphtheria bacilli, meningococci and other pathogens of everyday occurrence, which when not evident in a film preparation are immediately subjected to cultivation. The staining and searching of film preparations of sputum as a standard for the bacteriologic diagnosis and control of pulmonary tuberculosis is, the author states, illogical and deplorably low.

1:717-746 (June 14) 1941

*Acute Anterior Poliomyelitis and Vitamin B Deficiency. Karen Helms.—p. 717.
Psychology of War. J. Bostock.—p. 723.
Streptococcus Types in Scarlet Fever: Association of Change of Type with Complications and Cross Infection. Helen Kelsey, with commentary by F. V. Scholes.—p. 728.

Poliomyelitis and Vitamin B Deficiency.—Helms puts forth the view, for which she reviewed an extensive literature, that vitamin B deficiency is a predisposing cause of acute anterior poliomyelitis. She finds indirect evidence in the fact that poliomyelitis tends to occur with greater frequency when the demands for vitamin B_1 are heavy, as in childhood, pregnancy, substandard nutrition and after excessive muscular exercise in children, or young adults, when poliomyelitis is prevalent. There are points of resemblance too between poliomyelitis and beriberi, which is known to be caused by vitamin B_1 impairment. The direct evidence, the author thinks, would be supplied if suitable tests could be devised. She suggests the investigation of the vitamin nutrition of patients suffering from poliomyelitis. These investigations should include the intake of the vitamin B complex, the conditions which increase the need for the vitamin or interfere with its absorption and, in adults, the amount of alcohol and narcotics taken. The presence of neutralizing substances in the blood may tend to reduce the occurrence of the paralytic form of the disease but does not seem to be a potent factor. The low incidence of paralytic poliomyelitis among those exposed to the disease may be due to the fact that this form occurs only when the biochemical state of the central nervous system favors the propagation of the virus. Vitamin B deficiency may constitute one cause of biochemical alteration. One investigator, reporting 5 cases of acute poliomyelitis, attributed the rapid recovery, with freedom from paralysis or rapid regression therefrom, to vitamin B therapy. Ordinary white flour, made from grain milled according to modern processes, consists entirely of starchy endosperm and contains neither the germ nor the bran, the former of which is nutritionally the best part of the seed. It is poorer than whole meal flour in vitamin B_1 (thiamine) and vitamin B_2 (riboflavin), both of which are concerned with tissue respiration. Modern milling processes were adopted in 1870. Acute anterior poliomyelitis seems to have increased since 1880.

Tubercle, London

22:79-110 (April) 1941

*Tuberculosis of Pericardium and Heart. H. Hannesson.—p. 79.
X-Ray Protection. M. C. Reinhard.—p. 100.

Tuberculosis of Pericardium and Heart.—Hannesson states that tuberculous pericarditis from an adjoining tuberculous lesion is not as rare as is generally supposed. According to Kornblum, Bellet and Ostrum, the incidence in general necropsies is approximately 1 per cent and about 4 per cent in necropsies on patients with pulmonary tuberculosis. A diagnosis of tuberculous pericarditis can be made only when the following are present: signs and symptoms of an infection, pericardial friction rub, pericardial effusion and thickening and signs of adhesions, signs of circulatory failure of the "inflow stasis" type, signs of extension of the process to other serous sacs or a disseminated tuberculosis and a normal or small heart as demonstrated after a pneumopericardium. A clinical diagnosis can be made on a careful physical and roentgen examination. An exact diagnosis is possible only by demonstration of tubercle bacilli in the pericardial fluid. Tuberculosis limited to the pericardium is rare, as is tuberculous involvement of the myocardium and the endocardium. In miliary tuberculosis tubercles may be demonstrated in the myocardium at necropsy, but their presence cannot be detected clinically. Tuberculosis of the pericardium is usually a fatal disease (the mortality is around 83 per cent). If the tuberculous process in the pericardium and elsewhere subsides, the mechanical effects on the heart are the result of pericardial healing. The inflammatory process heals, with resulting cohesion of the visceral and parietal layers of the pericardium and partial or complete obliteration of the sac. This imposes extra work on the heart and results in cardiac hypertrophy and sometimes in ultimate heart failure. If the pericarditis is extensive and particularly if associated mediastinitis exists, the resulting fibrosis may hamper the right auricle and the great veins and partially obstruct the return of blood to the heart. This results in chronic congestion of the liver and causes recurrent ascites. This condition is known as chronic mediastinopericarditic pseudocirrhosis of the liver, or Pick's disease. The occurrence of anatomically primary tuberculous pericarditis is questioned. Tuberculous pericarditis is seen most often in men past 40 years of age. Negroes appear to be more susceptible than white persons. Polyserositis is probably tuberculous in origin.

Schweizerische medizinische Wochenschrift, Basel

71:529-548 (April 19) 1941

*New Points of View on Diagnosis and Therapy of Pneumococcic Peritonitis. G. Neff.—p. 529.
Treatment of Crural Ulcer by Means of Injection of Varices. K. Sigg.—p. 532.
Phenylmercuric Borate (Merfen) in Treatment of Dermatoses. F. Wyss-Chodat.—p. 534.
Donaggio's Reaction. H. Brandt and W. Schusselé.—p. 536.
Is Campaign Against Cancer Adequate? P. Jung.—p. 538.

New Points of View on Pneumococcic Peritonitis.—Neff points out that diagnosis of pneumococcic peritonitis is difficult because it is readily confused with gangrenous appendicitis and perforation peritonitis. The disease attacks chiefly small girls. The previous history often discloses a renal disorder, a vulvovaginitis, a bronchitis or other infection. The attack is often preceded by diarrhea in contrast to appendicitis, which is usually preceded by constipation. The onset is sudden with high fever and diffuse abdominal pain. Herpes labialis is frequently present, but the psoas phenomenon is absent. The children present cyanosis and other signs of severe intoxication. Pulse rate and temperature are usually elevated, and a fairly high leukocytosis is present. The sensorium is dulled, and delirium may supervene. The diagnosis is fairly certain if many of these symptoms are present, but none are pathognomonic. The lack of certainty in the diagnosis presents a difficult problem, especially if peritonitis from appendicitis cannot be definitely excluded, since laparotomy is not only useless in pneumococcic peritonitis but may even be harmful in the early stages. The author reports 3 cases of pneumococcic peritonitis in which laparotomy verified the diagnosis. Sulfanilamide therapy was at once instituted and the patients recovered. The author suggests that a laparotomy be performed at once, whenever pneumococcic peritonitis is suspected, in order to make a definite bacteriologic diagnosis. The appendix should always be removed in order to avoid later adhesions. The sulfanilamide is first administered by injection but, after the intestinal activity has been reestablished, may be given by mouth. The author used sulfapyridine in the beginning but later turned to sulfathiazole because the latter is less toxic. He warns against attempting to establish a diagnosis of pneumococcic peritonitis "ex juvantibus" by giving sulfathiazole before performing a laparotomy. The sulfanilamides effect a reduction in temperature also in streptococcic or Escherichia coli peritonitis resulting from appendicitis, and thus an erroneous diagnosis might result and much valuable time be lost if the appendix has to be removed.

Clinica, Bologna

6:571-646 (Sept.) 1940. **Partial Index**

*Influence of Ascorbic Acid on Velocity of Healing of Experimental Wounds. M. Trincas.—p. 594.
Roentgen Picture of Cancer of the Stomach. N. Parere.—p. 601.
Plethysmography, Arterial Blood Pressure, Rhythm of Heart and Cutaneous Vasomotor Reactions to Nicotinic Acid in Nonpellagrous Men. M. Bassi and E. Liesch.—p. 620.

Influence of Ascorbic Acid on Wounds.—Trincas experimented with two groups of guinea pigs, those on a normal diet and those given alternating scurvy causing diets for twenty days. Wounds were inflicted on the animals at the beginning of the third week of the experiment, and the wounds were infected with staphylococcus cultures. The animals with avitaminosis C were divided into four groups, those having daily subcutaneous injections of 0.5, 3 or 6 mg. of ascorbic acid in the course of the scurvy causing diet and those receiving no ascorbic acid but in which the scurvy producing diet was discontinued and a normal diet resumed. The author found that a scurvy producing diet retards healing of wounds. Ascorbic acid injected subcutaneously in a daily dose of 3 mg. in the course of a scurvy causing diet accelerated healing. The course of healing is the same when ascorbic acid is administered daily in a dose of 3 mg. as when 6 mg. of the substance is given. Healing is more rapid and of a better character when the scurvy producing diet is discontinued and a normal diet is resumed without administration of the ascorbic acid.

Rivista di Patologia e Clin. d. Tubercolosi, Bologna

15:133-190 (March) 1941. **Partial Index**

*Anal Fistula in Tuberculosis. V. Basunti and S. Sticotti.—p. 144.

Anal Fistula in Tuberculosis.—Basunti and Sticotti examined 732 patients with surgical or pulmonary tuberculosis for the presence of anal fistula. This was found in 47 patients with pulmonary tuberculosis and in 1 with surgical tuberculosis. All but 4 were men. Of the 47 patients with pulmonary tuberculosis and anal fistula, 29 suffered from an advanced destructive, exudative form of tuberculosis and 18 from the productive type. The perianal abscess developed early or late in the course of tuberculosis without any relation to the progression of the course of the pulmonary disease. Tissues of the wall of the fistula were excised in 27 and were used for a biologic test on guinea pigs and for cultures. Tissue of 12 patients with ulcerative pulmonary tuberculosis gave positive results for tubercle bacilli in 8 by the biologic test and in 7 by culture. Those of 15 patients with fibrous pulmonary tuberculosis who were sputum negative gave positive results for tubercle bacilli in 7 instances by the biologic test and in 2 by culture. A microscopic study of perifistular tissue in 5 cases showed the presence of tubercles in 2 cases, a diffuse tuberculous tissue reaction in 1 case, reticuloendothelial proliferation with inflammation in 1 case and a nonspecific tissue reaction in 1. The authors believe that perianal abscess which precedes the formation of anal fistula is tuberculous and that tubercle bacilli reach it by way of the blood.

Prensa Médica Argentina, Buenos Aires

28:1091-1142 (May 21) 1941. **Partial Index**

*Clinical Value of Determination of Thrombogen in Blood. M. Acuña and A. A. Lobo.—p. 1091.

Thrombogen in Blood.—According to Acuña and Lobo, determination of the amount of thrombogen in the blood is of diagnostic value for determination of liver functions. It is of clinical value for recognition of need of vitamin K therapy in types of hemorrhage caused by disorders of the thrombogen metabolism. The authors made determinations of the blood thrombogen of normal children and adults and in a group of patients with various diseases. They found that the level of blood thrombogen in normal children and adults is constant on repeated determinations. The blood thrombogen level is diminished in acute diseases of liver with increased bilirubinemia, is normal in hemophilia despite the increase in the number of platelets, and is greatly diminished in rectal hemorrhage of newborn infants. The prolonged coagulation time in hemophilia is probably due to functional alteration in the platelets. Vitamin K administered in large doses moderately increases thrombogenemia in diseases of the liver with subacute dysfunction and fails in acute diseases of the liver. Rectal hemorrhage in newborn infants is caused by a transient hypoprothrombogenemia which is rapidly controlled by vitamin K therapy and blood transfusion. The latter should not be dispensed with. It provides blood with thrombogen already formed, which stimulates the liver to production of thrombogen. It is advisable to transfuse fresh blood, because the potency of thrombogen is diminished in preserved blood.

Archiv für Gynäkologie, Berlin

170:457-666 (Nov. 7) 1940. **Partial Index**

*Treatment of Irregular and Prolonged Genital Hemorrhages Caused by Hormonal Dysfunction. C. Kaufmann and W. Giesen.—p. 457.
Action of Follicular Hormone on Function of Human Uterine Musculature. M. Kneer.—p. 483.
Studies on Thiamine Hydrochloride in Gynecology and Obstetrics. A. Hildebrandt.—p. 540.
Increasing Efficacy of Ecbolics by Means of Calcium. H. Hückel.—p. 584.
Dystrophic Changes of Vagina in Nursing Mothers as Result of Deficiency of Follicular Hormone. Maria Alexiu.—p. 626.
Trauma Caused by Forceps and Intracranial Hemorrhage. R. Bayer.—p. 638.

Treatment of Genital Hemorrhage Due to Hormonal Dysfunction.—Kaufmann and Giesen survey therapeutic results obtained in genital hemorrhages caused by defective hormone production of the female gonads. They emphasize that irregular and prolonged hemorrhages can be regarded as hormonal in origin only if the source of hemorrhage has been established

by microscopic examination and that this is best accomplished by means of the so-called strip abrasion curettage (Reifferscheid's strip curet). Complete curettage may cause damage to the basal layers of the mucosa and therefore should be limited to the cases in which it is absolutely necessary. A thorough knowledge of disorders and administration of the correct type of endocrine preparations in adequate doses are the prerequisites to a successful treatment. The majority of genital hemorrhages are caused by glandular cystic hyperplasia of the endometrium, which in turn results from persistence of a follicle. Administration of adequate quantities of progesterone is the best method of treatment. If strip abrasion has demonstrated glandular cystic hyperplasia, the authors administer 10 mg. of progesterone on six successive days. In young girls with demonstrated glandular cystic hyperplasia, treatment with progesterone produces a permanent cure because the upset in the coordination of the ovarian function has been counteracted. In the glandular cystic hyperplasia which develops in sexually mature women the progesterone treatment is not as reliable. In these women persistence of the follicle with subsequent hypertrophy of the mucosa is chiefly a sequel to a constitutional pluriglandular insufficiency. This is proved by the fact that only 3 of 14 women were cured; in 9 the treatment had only a substitutional effect, whereas in 2 the bleeding was uninfluenced. The authors believe that in these women the substitutional effect of progesterone is all that can be expected. Glandular cystic hyperplasia in women of premenopausal or the menopausal age is more favorably influenced by progesterone. One series of progesterone treatments produced a cure with freedom from relapse for at least a year in 7 of 11 women. In 3 women a relapse made a second progesterone treatment necessary; 1 woman was treated with a corpus luteum preparation following a recurrence. Estrogen did not prove satisfactory in the treatment of glandular cystic hyperplasia. Genital hemorrhages may be caused also by inadequate development of the uterine mucosa. In these cases a normal endometrium must be built up by means of successive administration of both gonadal principles. The authors treated 6 such patients. A girl of 14 with pronounced asthenia was treated unsuccessfully. Of 5 women between 17 and 32 years of age, 3 were cured; in 1 woman the treatment had merely a substitutional effect, and in the other no improvement was obtained. Four young girls in whom a strip abrasion was not possible were treated empirically with progesterone and the treatment was successful in 3.

Archiv für Kinderheilkunde, Stuttgart

122:65-112 (Feb. 25) 1941

*Auxiliary Control of Tuberculosis by Means of Calmette Prophylactic Vaccination. A. Wallgren.—p. 65
Roentgen Diagnosis of Otitis and Mastoiditis in Infants and Preschool Children. P. Sonnauer.—p. 77.
Prognosis of Middle Ear Inflammation in Nurslings, with Reference to Role Played by Infective Agents. P. Dudás and S. Halka.—p. 85.
Clarification Zones in Long Tubular Bones Found in Leukemia of Children. K. Gefferth.—p. 94.

BCG Vaccination.—Wallgren reports the observations made in Göteborg (250,000 inhabitants) of the prophylactic value of Calmette's vaccine during the course of more than ten years, with two general surveys (in 1933 and 1938). The first survey included 355 children, 230 of whom had been exposed for at least two months to a contaminated environment after inoculation. Two deaths had occurred, but no pulmonary lesions had been found at necropsy. Pulmonary lesions due to primary tuberculosis were seen in only 1 case; in 11 others insignificant lung changes could be traced to nontuberculous diseases. All others showed a normal roentgenogram and were clinically healthy. The second general immunologic inventory included 1,069 children and adults. Of these, 15 had died in the meantime from other causes; 149 failed to take the test, but 53 of these were reliably reported in good health. Of the remaining 905 subjects, 397 were definitely known to have lived in a contaminated environment; in 207 no exposure could be ascertained; the majority of the remaining 301 were assumed to have been exposed to infection. In no inoculated and exposed children could pulmonary changes of a tuberculous origin be determined. The average tuberculin-positive reactions for the three groups was 97 per cent (97.2, 96.1 and 97.3 per cent). The mortality rate for all small children in Göteborg fell from about 4 per thousand for the three five year periods preceding the introduction of BCG vaccination to 1.4 per thousand in the survey of 1933 and to 0.5 per thousand in the survey of 1938. A modified form of Calmette's technic was used, in which the dosage was greatly reduced (to 0.5 mg.) and the intracutaneous administration employed. This small dosage was generally found to be sufficient to induce tuberculin sensitivity without local abscess formation. The author calls attention to certain guiding principles adhered to in the use of BCG vaccine, such as the vaccination solely of subjects definitely determined to be free from tuberculosis; the continuation, with increasing doses, of vaccination until a positive tuberculin reaction was obtained; the isolation of children from contaminated homes for a longer period of time, and the isolation of vaccinated children usually for two months after inoculation. Newborn infants were regarded as nontuberculous and vaccinated immediately after birth. The author believes that BCG vaccination, rationally performed, apparently reduces the danger of more serious forms of primary tuberculous lesions after virulent infection and that more serious forms of pulmonary tuberculosis appearing subsequent to primary pulmonary infection of juvenile infection may conceivably be prevented to a certain extent by BCG vaccination. Tuberculin sensitivity and specific relative protection conferred by the vaccine may be assumed to last for ten years or more. The author feels that the absence of comparable control groups, due to the popularity of Calmette's technic in his city with the consequent cooperation of the public, affects appraisal values. Only 10 persons were found who had refused vaccine prophylaxis. Of these, 5 had died of tuberculosis, whereas no deaths were recorded for the group of 397. In spite of his cautious evaluation of Calmette's vaccine, the author's aim is to undo some of the prejudice entertained in Germany, since the Lübeck disaster, against BCG vaccination.

Beiträge zur klinischen Chirurgie, Berlin

171:161-336 (June 12) 1940. **Partial Index**

Cancer of Free Portion of Small Intestine. W. Geisthövel.—p. 161.
*Traumatic Edema of Hand. Schörcher.—p. 176.
Carcinoma Caused by Roentgen Rays. W. Pohl.—p. 195.
True Esophageal Hiatus Hernia and Its Surgical Treatment. W. Nell.—p. 211.
Diseases of Iliosacral Joints with Special Consideration of Inflammatory Diseases and Their Pathogenesis. U. Graff.—p. 226.
Posttraumatic Edema. W. Wagner.—p. 261.
Differential Diagnosis of Acute Osteomyelitis of Patella. H. Sprengell.—p. 283.
Aspects of Postoperative Massive Pulmonary Collapse. F. Schendzielorz.—p. 297.

Traumatic Edema of Hand.—According to Schörcher, traumatic edema of the hand develops as a rule a few hours after a slight dull injury to the hand. The back of the hand swells, and the thenar and hypothenar eminences and other soft parts of the hand become involved. The cutaneous rugae disappear; the skin becomes shiny and bluish pale and feels much cooler than the opposite hand. The swelling does not pit on pressure. Sweating may be increased or decreased. Motility of the fingers is restricted, so that making a fist is impossible. The hand is painful and hypersensitive to cold. The grave course of the disorder contrasts strongly with mildness of the injury. Operation offers the only cure. The cause is unknown, but from the effectiveness of surgical intervention on the nervous system it has been surmised that a constitutional inferiority of the neurovascular system is responsible. The author reports the history of a patient who developed edema of the right hand following a street car accident. Externally no injury was visible, but the hand became painful and two hours later presented an elastic swelling. Poultices, ointments, hot air, massage, exercises and roentgen treatment persisted in for ten weeks proved of no avail. Intervention on the sympathetic nervous system was decided on next. Several cubic centimeters of a 0.2 per cent solution of pontocaine hydrochloride was injected into the right stellate ganglion. This reduced the swelling of the hand but also produced Horner's syndrome. The swelling and pain recurred six days later. Anesthesia of the stellate ganglion was repeated with the same result, except that the improvement lasted only two

days. Next, the stellate ganglion was resected, resulting in the disappearance of the swelling, which, however, recurred seven weeks later. A periarterial sympathectomy was now performed on the recurrent ulnar artery. The edema disappeared within thirty-six hours but reappeared four days later. Periarterial sympathectomy was then performed on the ulnar artery at the wrist. Four weeks later the woman worked again as a milliner, but the edema recurred and local anesthesia was induced in the ulnar nerve at the elbow. The swelling subsided on the ulnar side of the hand. Three weeks later a silk thread drainage was introduced, and this controlled the swelling and pain after two weeks. The patient has since worked for eight months without further trouble. In the type of traumatic edema under discussion, the tissues show no inflammatory changes. Traumatic edema of the hand has been explained in various ways. The author is opposed to the assumption that the anatomic structure of the fascia of the hand is responsible. Those who regard traumatic edema of the hand as a reflex neurosis consider only the blood vessels to the exclusion of lymph vessels. The author argues that the lymphatic system must likewise have a sympathetic innervation and shows that in edema of the hand the pathologically increased peripheral sympathetic reflexes act not only on the blood vessels but on the lymph vessels as well. The fact that the silk thread drainage counteracted the edema is additional proof that the condition is due not only to the impairment of the capillaries but to that of the lymph vessels as well.

Chirurg, Berlin

12:341-372 (June 15) 1940

*Present Status of Surgery of Biliary Tract. F. Bernhard.—p. 341.
Discharge of Bile by Hepatocholangiocholecystostomy. E. Derra.—p. 358.
Gas in Biliary Calculi: Star-Shaped Areas of Lesser Density in Roentgenogram. W. Abel.—p. 360.
Stenosis of Pylorus Caused by Unusual Course of Ligamentum Teres Hepatis (Round Ligament). J. Volkmann.—p. 363.

Surgery of Biliary Tract.—Bernhard feels that cholecystostomy has been overshadowed by cholecystectomy. Recently the pendulum has begun to swing back and some of its advantages are being once more recognized. Cholecystostomy is advisable in cases of acute cholecystitis in which, because of the impaired general condition or advanced age, a cholecystectomy will perhaps not be tolerated. Cholecystostomy has the added advantage that it can be performed under local anesthesia. It may eventually save the life of a patient with severe hepatogenic icterus in which cholagogues have failed to induce the flow of bile. It is useful in the treatment of cholangitis or of severe jaundice caused by calculi. Cholecystostomy has been regarded by some as a method which preserves the function of the gallbladder. Cholecystography after operations revealed, however, that the function is restored in only a few cases when the operation was done for a severe inflammation. Cholecystostomy is to be regarded as an emergency operation when life is in danger. It has the disadvantage that another operation becomes necessary in from 10 to 20 per cent. With cholecystectomy, technic is of less importance than the question of whether the operation is to be performed during the acute attack or after it has subsided. The author recommends the expectant attitude, bearing in mind, however, that the liver and particularly the pancreas are involved. Severe involvement of the pancreas, which can be ascertained by determining the diastase content of the urine, may indicate a prompt operation in order to avoid further impairment of the organ, which may develop into an acute pancreatic necrosis. At the author's clinic it has been the rule to wait for the disappearance of the acute signs of inflammation, and there were no perforations or other complications. Careful observation is essential so that proper measures can be undertaken at once if acute exacerbation should set in. Many of the failures of the conservative procedure in acute cholecystitis are the result of faulty treatment. Patients with grave symptoms are given no food or fluid by mouth for the first two or even three days. Application of heat counteracts the spasms. The so-called strawberry gallbladder is difficult to diagnose. The cholecystogram is often normal, but the functional tests of the pancreas may reveal pathologic values. If the diastase content of the urine is greatly increased in the presence of typical colics, a strawberry gallbladder is to be suspected. Conservative treatment of the strawberry gallbladder is not effective. Its presence is an indication for a cholecystectomy. Attention must be paid to the choledochus in the course of operative intervention on the gallbladder. Since external palpation of the choledochus for stones is not reliable, it has been insisted by some that the duct be opened and explored. The author thinks that this is not necessary in every cholecystectomy and that the indication for a choledochotomy may be surmised from the clinical course. He recommends cholangiography during operation to decide whether the choledochus should be opened. Stenosis of the choledochus resulting from a chronic pancreatitis or stenosis of the papilla calls for a choledochoduodenostomy. The author evaluates this and other anastomotic operations and their indications.

12:405-436 (July 15) 1940

Technic of Combined Pleurolysis and Apical Plastics. W. Graf.—p. 405.
*Pathogenesis and Prevention of Coma of Exophthalmic Goiter. R. Herget.—p. 417.
Treatment of Tetanus and Prevention of Dangers of Serum Application in Prophylaxis and Therapy. C. Langemeyer.—p. 422.
Prophylaxis and Therapy of Tetanus. J. Csiki.—p. 427.
Tetanus in Spite of Wound Excision and of Administration of Serum. W. Haas.—p. 430.

Coma of Exophthalmic Goiter.—According to Herget the term "Coma basedowicum" (thyroid crisis) was coined by Zondek and was applied to a disorder which develops several hours or, at the latest, three days after an operation for exophthalmic goiter. The patient exhibits restlessness and incoordinated movements of the entire body. This persists for a shorter or longer period and culminates in stupor. As the stupor increases the clinical picture greatly resembles one of catalepsy or bulbar paralysis. The temperature rapidly increases to 40 C. or higher, but the surgical wound does not show reason for the rise. The heart action becomes increased, the pulse small, frequent and barely perceptible. Death nearly always takes place in the presence of signs of circulatory failure and exhaustion. The coma of exophthalmic goiter develops not only after operations on the thyroid but also after other operations and after infectious diseases. Various explanations have been given for the occurrence of the coma. The author made repeated determinations of the iodine content of the blood after thyroidectomy and found neither hyperthyroxinemia nor a hypothyroxinemia. He believes that adequate preparation for the operation by inorganic iodine is perhaps the most important factor in the prevention of the coma. The iodine medication is combined with strict bed rest, dietetic regimen and the administration of digitalis and quinine. In severe cases this preparatory treatment is followed by ligation of the superior thyroid arteries. The iodine medication is continued for another two weeks, after which the subtotal thyroidectomy is done. After the operation administration of iodine, digitalis and quinine is continued in decreasing doses. The successful treatment of the postoperative thyroid crisis consists in venesection with subsequent transfusion of blood of the same group.

Ugeskrift for Læger, Copenhagen

103:315-344 (March 13) 1941. **Partial Index**

*Coxa Saltans. A. Berntsen.—p. 327.

Coxa Saltans.—Berntsen reports thirteen cases of extra-articular snapping hip. He states that the mechanism of the audible snapping is the tripping of fascia tissue (the posterior part of the ileotibial band) over the greater trochanter on movement of the joint, either because the fascia is stretched too tightly or because the trochanter extends out too far. The phenomenon is usually produced on flexion in the hip, especially on active movement. Diagnosis is made on the characteristic snap and the palpable, eventually visible, gliding over the trochanter. Roentgen examination also is necessary. The only effective treatment is operative. Of the author's cases 5 were so distressing as to indicate operative treatment. Three of the cases were bilateral. Operation, according to Payr, gives excellent subjective and objective results.

Book Notices

Pharmacology. By J. H. Gaddum, ScD., M.R.C.S., L.R.C.P., Professor of Pharmacology in the University of London. Cloth. Price, $6. Pp. 407, with 74 illustrations. New York & London: Oxford University Press, 1940.

According to the author, this textbook is intended for "medical students at a stage in their education before general principles become obscured by a mass of practical details, but may also interest others." Dr. Gaddum has also attempted to present for medical men pertinent statements concerning the kind of evidence that justifies the clinical trial of new drugs when such trial is requested by drug manufacturers. The book contains twenty-two chapters, which discuss inorganic salts and fats of the diet, vitamins, hormones of known and of unknown structure, stimulants of the central nervous system, narcotics and other depressants of the central nervous system, body temperature (pyretics and antipyretics), sensory nerves, motor nerve endings, muscles, the alimentary canal, circulation, blood, kidney, respiration, proteins, heavy metals and metalloids, drugs which destroy life, chemotherapy and general pharmacology. The titles do not always create a clear impression as to what may be expected in subsequent reading. However, the index is sufficiently extensive to offset this fault partially.

An introduction on pharmacologic literature creates a pleasant impression in that it informs the reader where to look for supplemental reading. This advice is often lacking in textbooks on pharmacology. Another pleasing feature is the author's brief discussions of the more common tests for hormones, vitamin deficiencies and other commonly employed medicinal agents. Most of the fifteen tables present pertinent information in a manner that allows the reader to grasp in an instant the relation of the agents discussed; this is useful in the chapters on the barbituric acid derivatives, the sympathomimetic amines and the disinfectants allied to phenol. However, these features do not compensate for the weaknesses which appear to be existent. One of the most irritating practices is the author's careless use of descriptive terms. For example, in the discussion on vitamin C deficiency there appears "the strength of the capillaries is diminished and hemorrhages occur"; in a reference to the history of vitamin D and rickets the expression "started the ball rolling" is used; in myxedema the "blood is cold" and, "when the diet does not contain enough iodine, the thyroid tries to make bricks without straw and becomes distended with inactive colloid." In the discussion of the action of the parathyroid glands the author writes "The injection of parathyroid extracts (parathormone) raises the blood calcium by dissolving calcium out of the bones . . ."; and the phrase "sucking in water" is used in describing the effects of hypertonic and hypotonic solutions in the intestine and blood corpuscles. Another source of irritation lies in uncompleted pharmacologic statements; e. g., the author claims that "morphine stimulates some centers and inhibits others" and "the vasoconstrictor action of the adrenaline keeps the procaine localized and so prolongs the local anesthetic action, but large doses of adrenaline may increase the toxic action of procaine." The first question which the average student will ask when he reads these assertions will consist of the one word "Why?" An adequate explanation will have to be forthcoming from other sources.

The author states that his book is intended for medical students, but it is hard to perceive how the present edition can ever become popular with students of American schools. It is not without inaccuracies and it reads as if it had been intended for preuniversity students. Those who have a fair understanding of pharmacology may occasionally pick up a morsel of information in Gaddum's book, but the American medical student would not be satisfied to use it as an authoritative textbook. It conveys the impression that the information it contains is a combination of brief general discussions on the more common drugs and on laboratory procedures rather than a textbook on pharmacology. In the present era medical students are being taught the basic principles of the more important drugs so that a practical knowledge of therapeutics may be evolved. This compares favorably with the older practice of forcing students to memorize actions and uses and promotes a desire, and often the necessity, of "outside" reading. Obviously, the more progressive pharmacology department will have available the majority of recent books on pharmacology and allied subjects. Gaddum's Pharmacology may thus become available to the students.

Science and Seizures: New Light on Epilepsy and Migraine. By William Gordon Lennox, M.D., Sc.D., Assistant Professor of Neurology, Harvard University Medical School, Boston. Cloth. Price, $2. Pp. 258, with 10 illustrations. New York & London: Harper & Brothers, 1941.

This book apparently was meant for popular and medical consumption. There are two parts. Part one discusses convulsive seizures and consists of twenty chapters. Part two discusses headache seizures and consists of eight chapters. The author states that this publication can supplement the advice given by the physician or help the layman whose interest "may be a result of his desire to keep abreast of modern thought in medical matters or those who are handicapped by ill health or by popular ignorance." These thoughts are splendid if one is writing about a specific disease with specific etiologic factors. For symptoms like convulsions, on which numerous scientific contributions have been made for the past fifty years and for which, even at this date, no specific etiologic factors have been found, it is extremely questionable whether they can be discussed from a layman's point of view. The layman is not able to comprehend the various anatomic, biologic, psychologic and physiologic phenomena involved in the discussion of convulsions. He cannot classify the various types of seizures and has no training in appreciating the various etiologic factors. Why should a book for lay consumption discuss, for example, such a complicated test as the use of the electroencephalogram? How can one expect a layman to understand it when so many physicians have not had time to study this new test? Further, is this test a specific one for epilepsy? The average layman cannot understand the implications of Berger rhythm unless he is a physicist or an electrical engineer with special training. The question of Berger rhythm is not fully understood and should not be dished out as something specific. For example, it is not clear why the author, on page 19, speaks of "a cerebral dysrhythmia" being a logical substitute for the word epilepsy and then states that "the article a needs to be included because there are other cerebral dysrhythmias accompanied by symptoms which are not ordinarily classed as epileptic." For physicians this publication does not come up to the new standard textbooks or contributions on convulsive disorders and migraine.

Histological Studies on the Normal and the Irradiated Suprarenal Gland in Rabbits. Contribution to the Subject of Seasonal Changes in the Adrenal Cortex and of the Differentiation of the Cortex Cells. By Olav Torgersen. Skrifter utgitt av det Norske Videnskaps-Akademi i Oslo, I. Mat.-Naturv. Klasse. 1940. No. 2. Paper. Pp. 112, with 25 illustrations. Oslo: Jacob Dybwad, 1940.

This monograph represents a thesis, by the author, on his histologic studies of the normal and of the irradiated adrenals, in rabbits. It consists of eighty pages of text, fourteen pages of tables, seven plates and eleven pages of bibliography. The English translation from the original is good, although some transliteration, in places, may cause difficulty in reading if one is not familiar with languages other than English. The author reviews the literature on the normal physiology and histology of the adrenals and on experimental irradiation of the glands. His review of the literature on physiology is superficial and lacks critical interpretation; the other phases are well presented. He has emphasized the lack of control observations in the experimental work hitherto reported on irradiation; also failure to exclude seasonal variations in the cytologic inclusions of the adrenal cortex in relation to phenomena observed experimentally. Various other sources of experimental error are discussed very well. Histologic technic and technic for irradiation are well described, and the author distinguishes between primary effects of irradiation on the adrenals and secondary effects from the exposure of tissues other than the adrenals. He also has observed that while the cortical cells may show degenerative changes there is no evidence of degeneration of the medullary cells regardless of dosage of roentgen rays employed. This is of special interest in view of the practice of irradiation of the adrenals for various diseases on the supposition that epinephrine

secretion from the medullary cells can be reduced or suppressed by exposure to roentgen irradiation. The author has presented the results of his own extensive experimental studies on irradiation of the adrenals. These are illustrated in elaborate tables and with photomicrographs. His objective observations on the cytology of the rabbit's adrenals are based on well controlled experiments. The monograph should be of interest to histologists and to experimental physiologists who are especially concerned with the cytology of the adrenals under normal conditions and as affected by roentgen irradiation.

Medicine and Human Welfare. By Henry E. Sigerist, M.D., D.Litt., William H. Welch Professor of History of Medicine in the Johns Hopkins University, Baltimore. Cloth Price, $2.50. Pp. 148, with 20 illustrations. New Haven: Yale University Press; London: Oxford University Press, 1941.

These three lectures were given by Dr. Henry E. Sigerist, who is William H. Welch professor of the history of medicine in Johns Hopkins University, as the Terry Lectures at Yale University. Dr. Sigerist is referred to by Louis Fischer in a recent volume as "a stiff-necked advocate of the Soviets." These three lectures reveal that Dr. Sigerist is an excellent historian in the field of medicine but that his information and his views regarding the practice of medicine are greatly modified by the point of view reflected in Fischer's characterization. Briefly, it is Dr. Sigerist's view that the technology of medicine has outrun its sociology and that the only way to cure the situation is to remove the doctor from the sphere of competitive business, free him from economic worries or, in other words, put him on a salary. His final chapters are an unqualified advocacy of the system of medicine established in the Soviet Union.

Toughen Up, America! By Victor G. Heiser, M.D. Cloth. Price, $2. Pp. 228. New York & London: Whittlesey House, McGraw-Hill Book Company, Inc., 1941.

This is just another book giving advice on health and hygiene. It is chiefly a retelling of the well known and little heeded facts that we must eat, sleep and play in order to be healthy. Some physicians will not agree with some of the statements the author makes in suggesting certain foods for the daily diet. For example, the idea of alfalfa as a dinner vegetable will leave most persons cold. The advice given on exercise is sane, but the author should make it a bit more clear that no one should indulge in any program of exercise, even for recreation, without being certain that he has been recently examined and has no defects which might be made worse by exercise. The anecdotes of the author's experiences during his world travels are an attractive feature of the book. There are too few of these.

Mercurialism and Its Control in the Felt-Hat Industry. By Paul A. Neal, Surgeon, United States Public Health Service, et al. From the Division of Industrial Hygiene, National Institute of Health. Prepared by direction of the Surgeon General. Federal Security Agency, U. S. Public Health Service. Public Health Bulletin No. 263. Paper. Price, 20 cents. Pp. 132, with 36 illustrations. Washington, D. C.: Supt. of Doc., Government Printing Office, 1941.

This report is an excellent piece of work. Aside from the technical worth of the results obtained, the most interesting aspect of the investigation was revealed in the helpful attitude of all agencies approached. In order to conduct the survey it was necessary to secure the active cooperation of the owners and managers of the hat manufacturing plants and also of the labor union organizations to which the hatters belong. The study itself was conducted with the assistance of the Bureau of Occupational Diseases of the Connecticut State Department of Health. Local physicians practicing in the communities where these plants were located contributed their personal observations, and three state hospitals made their records available. Participation in the study must necessarily have had excellent educational effects on all these interested groups. No cases of mercurialism were found among workmen exposed to less than 1 mg. of mercury per 10 cubic meters of air. In all, 59 cases of chronic mercurialism were found among 534 hatters —something better than 10 per cent. The argument for the substitution of a nontoxic carroting agent is obvious. Indeed, the latest bulletin from the Division of Industrial Hygiene states that pursuant to the findings in this investigation the use of mercurial carroted hatters' fur in the manufacture of hats will be prohibited as of Dec. 1, 1941. The methods for the control of mercurial vapors are outlined in the report, and medical findings are set down in detail. An interesting section of the study deals with the results of an inquiry among practicing physicians in and near Danbury. The report is a valuable addition to existing studies on industrial health problems and suggests that a worthwhile pattern has been set up for the conduct of similar investigations.

A Diabetic Manual for the Mutual Use of Doctor and Patient. By Elliott P. Joslin, M.D., ScD., Medical Director George F. Baker Clinic at the New England Deaconess Hospital, Boston. Seventh edition. Cloth. Price, $2. Pp. 238, with 53 illustrations. Philadelphia: Lea & Febiger, 1941.

This volume is now in its seventh edition because, as Dr. Joslin says in the preface, "there is always something new going on in diabetes." Moreover, the number of the diabetic is increasing because people are living longer. Therefore, education for this class becomes a more important problem. This volume is fully established as a most useful book in its field. It is up to date, well printed, excellently illustrated and written with inspiration. No intelligent person with diabetes should be without it.

Diseases Transmitted from Animals to Man. By Thomas G. Hull, Ph.D., Director, The Scientific Exhibit, American Medical Association, and others. Second edition. Cloth. Price, $5.50. Pp. 403, with 45 illustrations. Springfield, Illinois & Baltimore: Charles C. Thomas, 1941.

The first edition of this book was published in 1930. The new material developed in the past ten years makes a new edition necessary. The chapters on animal parasites, on fungous diseases and on psittacosis have been entirely rewritten and new chapters have been added on louping ill, sore mouth in sheep, equine encephalomyelitis, Rift Valley fever, typhus fever and relapsing fever. In the development of this book, Dr. Hull has called on a large list of competent consultants who have been giving special attention to the subjects discussed. The book is a handsome production, quite up to date, and scientifically dependable.

Endocrinology: The Glands and Their Functions. By R. G. Hoskins, Ph.D., M.D., Director of Research, The Memorial Foundation for Neuro-Endocrine Research, Harvard Medical School, Boston. Cloth. Price, $4. Pp. 388, with 6 illustrations. New York: W. W. Norton & Company, Inc., 1941.

In 1903 Dr. Hoskins published a book called "The Tides of Life." The material in that work has been drawn on as the basis for the present volume, which describes for the intelligent reader, both lay and medical, our present knowledge of the glands of internal secretion. He explains with easy readability, but the reader must be prepared to study the dictionary and to acquire the necessary vocabulary for complete understanding. The book is sound in that it does not accept as conclusive some of the recent beliefs in this field, but it does give enough of the theory to indicate how the activities of the endocrine glands affect our minds, our bodies and our lives.

Strange Malady: The Story of Allergy. By Warren T. Vaughan, M.D. Cloth. Price, $3. Pp. 268, with 7 photographs and 23 line drawings by John P. Tillery. New York: Doubleday, Doran & Company, Inc., 1941.

Dr. Warren T. Vaughan has made an excellent contribution to the dissemination of our knowledge of allergy in his medical book on the subject. This volume, which is the second in a series published under the auspices of the American Association for the Advancement of Science, reflects the information primarily for a public audience and indicates the author's great competence in writing for such a group. The illustrations, the case reports, which are more like anecdotes than case reports, and the information reflected are all just about what such a contribution should be. The book is one which may be safely recommended by any physician to an intelligent patient with allergy who wants to know what the medical profession knows about this subject.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

PROTECTION OF SKIN FROM CLEANING COMPOUNDS

To the Editor:—**The Air Corps uses large quantities of cleaning compounds for the cleaning of airplanes and engines. A formula used for the removal of carbon from engine parts is somewhat as follows:**

	Per Cent
Creosote oil (containing approximately 5 per cent of phenols)	50
Orthotoluidine	20
Diethanolamine	10
Oleic acid	10
Ethylene glycol	10

Such a compound is commonly diluted with water or kerosene in the proportion of 1 part to 5 of diluent. Some commercially available cleaning compounds for this use contain up to 50 per cent of commercial cresylic acid. Your recommendation and suggestions are requested in regard to the caustic and irritating properties of such compounds and the maximum percentage of creosote oil and phenolic compounds, especially cresylic acid, that might be permissible. It must be assumed that workmen would have the solution in contact with the skin during working hours.

F. O. Carroll, Lieut. Col. A. C., Wright Field, Dayton, Ohio.

ANSWER.—All the substances mentioned in this query are direct cutaneous irritants or sensitizers for some persons. If kerosene is used as the diluent an additional exposure is introduced, since a dermatitis develops in more than 30 per cent of persons long exposed to kerosene through direct contact. If water is used in the mixture, evaporation may lead to a higher concentration of irritants than was provided in the original 20 per cent dilution. It is believed that any dilution practical in metal cleaning will exceed the threshold of strength necessary to produce cutaneous injury. Furthermore, the elimination of one or two constituents may not be expected to remove the possibilities of injury for some persons, since this would lead to increased amounts of other constituents likewise cutaneous irritants.

Exposed workers must rely largely on the wearing of gloves and aprons. Ordinary rubber garments will be softened by kerosene and possibly by other constituents. For this reason resort may be had to synthetic rubber articles, of which neoprene may prove the best type. Various substances are available for application to the skin of the hands and forearms to serve as a barrier against cutaneous irritants. Under some circumstances these protective creams are highly successful. At times the most suitable material can be determined only by trial and error. Under any circumstances workers exposed in the operation described should maintain careful hygiene of the skin, rubbing in at the end of work periods small quantities of bland ointments to replace the cutaneous fat lost through contact with solvents. Isopropyl alcohol is recognized as a solvent for removal of creosote from the skin in the prophylaxis against creosote burns.

PASSIVE VASCULAR EXERCISES

To the Editor:—**May I ask your advice on various types of passive vascular exercisers?**

R. G. Mellen, M.D., Clinton, Iowa.

ANSWER.—There are three types of apparatus employed for passive vascular exercises: the oscillating bed, the apparatus for intermittent suction and pressure (pavaex) and the apparatus for intermittent venous occlusion. Consideration of the value of these three kinds of treatment can be placed under three headings: 1. The observations made by those who have invented or developed the specific apparatus; these are almost uniformly enthusiastic. 2. The physiologic evidence that these apparatus actually produce permanent improvement in circulation; this evidence is, for the most part, unimpressive and unconvincing. 3. Observations made relative to the clinical value of these apparatus. Opinions as to the clinical value of these methods of treatment vary greatly. The difficulty has been that other methods of treatment have been used at the same time, almost uniformly, and it is difficult to say whether the specific method of mechanical treatment or the general regimen of treatment is responsible for clinical improvement. The latter possibility seems most probable; the mechanical method of treatment has only contributed to the general scheme of treatment which has been satisfactory. It is true that the original enthusiasm relative to these specific methods of treatment has not been maintained when more mature observations have been made over longer periods of time.

A conservative opinion is that these methods of treatment contribute some but not intensively to the successful treatment of the conditions for which they were originally devised. The following references may be of value:

Herrmann, L. G.: Passive Vascular Exercises, Philadelphia, J. B. Lippincott Company, 1936.

Collens, W. S., and Wilensky, N. D.: Intermittent Venous Occlusion in Treatment of Peripheral Vascular Disease: An Experience with One Hundred and Twenty-Four Cases, THE JOURNAL, Dec. 25, 1937, p. 2125.

Barker, N. W., and Roth, Grace M.: The Treatment of Occlusive Arterial Disease of the Legs by Means of the Sanders Vasocillator (Sanders Bed), *Am. Heart J.* **18**: 312 (Sept.) 1939.

Allen, E. V.: Recent Advances in the Medical Treatment of Peripheral Vascular Diseases, THE JOURNAL, Dec. 30, 1939, p. 2375.

DIABETIC GANGRENE

To the Editor:—**A man aged 58, married, an Indian of mixed blood, fairly well nourished and known to have diabetes, was admitted to the hospital nine weeks ago. He stated that the little toe of his left foot had become frozen one week previously. His temperature was 101 F., pulse rate 100, respiratory rate 20, blood pressure 140 systolic and 82 diastolic and his weight 150 pounds (68 Kg.). The urine gave a 4 plus qualitative reaction for dextrose. All his toes except the great toe were gangrenous, with a darkened area extending to the middle of the sole. There was subcutaneous crepitation on the ventral surface and an offensive odor. The crepitating area was lanced, and moist dressings of potassium permanganate were applied to the foot. Therapy with insulin and sulfapyridine was instituted. The glycosuria was brought under control in three days. The insulin regimen three days postoperatively was ten units three times a day before meals, and diet was carbohydrates and fats in the ratio of 1:2½, with 1,830 calories. Carbohydrates totaled 60 Gm., protein 60 Gm. and fats 150 Gm. A higher carbohydrate diet tried earlier was poorly handled. The gas bacillus infection did not extend after twenty-four hours of medication with sulfapyridine. The toes were picked off nine days after admission. Pulsation in the dorsalis pedis artery was good throughout. Amputation in the midleg was done under spinal anesthesia twelve days after admission. There was no shock and a minimal loss of blood. One thousand cc. of a 10 per cent solution of dextrose in saline solution with 50 units of insulin was administered immediately after the operation. Retention of urine in the bladder required repeated catheterization. On the third day, after atropine, turpentine stupes and enemas of glycerin and soapsuds had failed to relieve the condition, a retention catheter was inserted. On the first postoperative day 10 units of insulin four times a day with saccharin tea and one slice of buttered toast for meals was given. There was mild glycosuria on the evening of the second postoperative day. Fifty units was given before the last feeding. On the next day this dose was maintained for two feedings. The patient became somnolent, and the urine gave a 4 plus reaction. Altogether, 4,000 cc. of physiologic solution of sodium chloride was given at six hour intervals for the next twenty-four hours, and 10 units of insulin every hour, with half a glass of orange juice. On the next, the fourth, day this regimen was maintained. Because of the fast and feeble pulse and poor tone of the bladder, 1/60 grain (0.001 Gm.) of strychnine sulfate was administered every three hours. By midnight the urine was sugar free and insulin was discontinued. The subsequent course has been gratifying. The temperature was normal twenty-four hours after operation and remained so. The only clinical indication of any acidosis was somnolence. There was no softening of the eyeballs, specific odor to the breath or respiratory abnormality. Unfortunately, laboratory facilities for testing acetone and diacetic acid were not available. Can this postoperative reaction have been due to interference with utilization of the insulin and, if so, on any other known basis than operative shock with or without acidosis? What criticism may be offered of the treatment?**

M.D., Minnesota.

ANSWER.—The patient recovered. It is doubtful whether the foot could have been saved under any circumstances. Decision is difficult, because the data furnished do not indicate how extensive the infection was, although it was sufficient to cause secondary gangrene of four toes in the presence of a palpable dorsalis pedis artery.

Evidently the patient had mild diabetes presumably of short duration, with good circulation in the extremities as shown by age, weight and amenability to insulin. Did the patient have a gas bacillus infection? One must remember that in diabetes it is not unusual to have subcutaneous crepitation which is due to gas-forming organisms other than the gas bacillus, and the favorable report of this case suggests this possibility. However, if the diagnosis really was a gas bacillus infection, then a guillotine amputation was indicated within twenty-four to forty-eight hours at most and not at twelve days after admission; furthermore, even at that late date a closed stump operation following a gas bacillus infection would involve too great a risk. These statements hold regardless of chemotherapy when one is dealing with a person with diabetes who has gangrene and a proved gas bacillus infection of the foot.

A preliminary diet of carbohydrates 100 to 150 Gm., protein 70 Gm. and fats 80 Gm. might have corresponded more closely to diets usually prescribed in diabetes. The insulin could be adjusted to the diet, 10 to 20 units on entrance before each of the three meals with 4 to 8 units on retiring. Subsequently

there might be a change to protamine zinc insulin, 20 to 40 units before breakfast plus crystalline insulin at the same time and temporarily, if needed, 12, 8 or 4 units also before lunch, dinner and retiring, according to whether the reaction of the urine to the Benedict test was red, orange or yellow. Soon all insulin save that given before breakfast might be omitted. On the morning of operation, if protamine zinc insulin was employed, it could have been deferred until the operation was over, or if crystalline insulin was employed the dose could have been cut in half. After the operation, every four to six hours, according to the results of the Benedict test, 12, 8 or 4 units of crystalline insulin could have been given. It might have been wiser to give 5 per cent dextrose in 1,000 cc. of saline solution twice during the day rather than 10 per cent dextrose in 1,000 cc. once. At any rate, after the administration of dextrose one should not be guided in immediate medication with insulin by the condition of the urine but should wait for a second specimen two or three hours later.

The unconsciousness could have been due to hypoglycemia despite the fact that the urine contained sugar, because the infection of the urinary tract complicated the picture, and the specimen of urine, although obtained by catheter, might not have represented the exact condition of the sugar in the blood at the same moment. Uremia, acidosis and the influence of drugs given for one reason or another must be borne in mind.

The rationale for the use of strychnine sulfate in the dose of 1/60 grain and atropine in urinary retention seems uncertain. Furthermore, considering the vulnerable skin of a person with diabetes one would ordinarily hesitate to make use of turpentine stupes.

IRON ADMINISTRATION AND TESTING STOOLS FOR BLOOD

To the Editor:—**In Queries and Minor Notes in The Journal, March 1, 1941, page 906, there is a query entitled "Testing Stools for Blood After Iron and Copper Administration." I would like to state that giving Blaud's pills, 5 grains (0.32 Gm.), three times daily for several weeks does not result in a positive reaction for blood in the stool with the benzidine test.**

I. J. Blumenthal, M.D., Long Island City, N. Y.

To the Editor:—**The query in The Journal on "Testing Stools for Blood After Iron and Copper Administration" reaches conclusions which are somewhat at variance with experiments which Oliver and I recently described (*J. Lab. & Clin. Med.* 26:727 [Jan.] 1941). I should be interested to know the basis for the opinion expressed.**

Allen S. Johnson, M.D., Springfield, Mass.

ANSWER.—The question as to whether the stools containing iron give a positive reaction for blood with the benzidine or guaiac tests is a confused one as far as the literature is concerned. Some reputable authors state that these tests never give positive results (Todd and Sanford), whereas others state that both may give positive results (Hunter and Wheeler). Experience indicates that both tests may give a result with iron which is similar to but not quite the same as that with blood. In the guaiac test with iron, although a blue color is obtained the color does not penetrate to any extent into the ether layer and is rather transient. This is not readily confused with the reaction of blood. The benzidine, on the other hand, gives a color which is more easily confused with the reaction of blood, although it should not be mistaken for blood if one makes a direct comparison. However, since in practice it is frequently confused, the statement was made that a positive reaction to benzidine might be obtained with iron.

PHENYTOIN ADMINISTRATION AND EDEMA

To the Editor:—**I have been reading about a number of unfavorable symptoms produced by phenytoin sodium in the treatment of epilepsy but have found no mention of edema in the upper or lower extremities. Does the continued use of this drug for twelve to fourteen months but never more than 6 or 7½ grains daily (0.5 Gm.) ever produce such a symptom? As long as the patient, aged 40, is on this dosage, she is free from petit or grand mal attacks, but taking her off entirely causes a return of the seizures. An opinion will be greatly appreciated.**

M.D., Ohio.

ANSWER.—Edema has not been reported as a toxic symptom from phenytoin sodium, but in view of the fact that excessive growth of hair and hypertrophy of the gums are well recognized manifestations it would seem reasonable to ascribe the edema to the medication. Unless there is evidence of kidney damage it is probably not a serious matter and might be expected to disappear spontaneously, like other toxic manifestations produced by phenytoin. Systematic exercise might be recommended. Elastic bandages and massage are of course to be considered, and up to 0.1 Gm. of phenobarbital might be substituted for one capsule of phenytoin.

ESTROGENS AND CHRONIC CYSTIC MASTITIS

To the Editor:—**A patient with chronic mastitis was examined by a gynecologist, who suggested dilation and curettage with insertion of a glass stem pessary into the uterus to relieve the patient of dysmenorrhea. He further stated that this therapeutic measure would relieve the patient both of her signs (lumpy breasts) and symptoms (painful breasts) of the chronic mastitis. What effect would a dilation and curettage with insertion of a glass stem pessary have on a chronic mastitis? What is the consensus as to the use of estrogens in the treatment of chronic mastitis?**

M.D., New York.

ANSWER.—A dilation (with or without curettage) and insertion of a stem pessary into the cervix often relieves dysmenorrhea, but there is no reason to suppose that this procedure will have any effect on chronic cystic mastitis. At the present time there is no satisfactory endocrine treatment of chronic cystic mastitis. The use of estrogens may actually aggravate this condition. Some authorities are of the opinion that chronic cystic mastitis is the result of excessive stimulation of the breasts by estrogen. It is much more logical to use testosterone propionate for the treatment of chronic cystic mastitis, but as far as is known no endocrine therapy will overcome chronic cystic mastitis permanently.

TRAUMA AND REPEATED ABORTION

To the Editor:—**A woman aged 27, two months pregnant, fell down a flight of stairs in a dark hallway. The following day she had slight vaginal bleeding, which gradually increased, and two days later passed a fetus. This occurred about fifteen months ago. She again became pregnant, and, during the fourth month of this second pregnancy, she aborted. Could this second abortion have been caused by the injury?**

M.D., New Jersey.

ANSWER.—There is little likelihood that residual trauma during the first pregnancy could be responsible for the second unintentional abortion. Although the interruption of the first pregnancy followed immediately after the accident, it is entirely possible that the external trauma precipitated the event but may not have necessarily been the cause of it. External trauma rarely results in abortion. Clinical experience indicates that the incidence of repeated abortion is greater in the person who has had a previous abortion. This fact is best demonstrated in the so-called habitual aborter who has three or more gestations which end disastrously. This abortion habit may well be due to underlying physiologic or endocrinal derangement the cause of which one may or may not be able to uncover during an examination.

MIGRAINE AND DIET

To the Editor:—**What is the value of diet in the relief of migraine headache? If it is of any value, what diet would you suggest?**

Robert L. Davis, M.D., Holbrook, Ariz.

ANSWER.—Various diets have been recommended for the relief of migraine. Three of these are worth trial, according to the indications in the specific case. An elimination and avoidance diet is of value in cases of migraine associated with allergic phenomena and a background of allergic tendencies. The exact diet used must depend on the elimination diet revealing the culpable allergen. Wheat, eggs, cheese and chocolate are the most frequent offenders. The second diet which may be tried in any case is the low carbohydrate regimen with an avoidance of the majority of starches and sugars. A moderate diminution of the intake of fluid is occasionally helpful in such a diet. Encouraging results have been reported from strict adherence to a ketogenic diet such as would be used in the treatment of persons with juvenile epilepsy. Assurance cannot be given that any of these diets will be effective in an individual case.

EFFECT OF ESTROGENS ON MENSTRUATION

To the Editor:—**What effect has the prolonged use of estrogens on menstruation? A patient having scanty menstrual periods showed a pituitary deficiency which was treated by discontinuance of theelin and the administration of anterior pituitary extract. Since receiving the extract there has been a decrease in nervousness and insomnia. There is also some decrease in the size of the thighs and the lower part of the abdomen.**

M.D., California.

ANSWER.—The prolonged use of estrogens may suppress menstruation for a while as the result of their inhibitory action on the pituitary. On the other hand the administration of large doses of estrogen especially for a long time may bring about bleeding from the uterus in women who have not menstruated for years. The bleeding may occur during the administration of the estrogens or more likely when their use is discontinued.